

N60200.AR.009008
NAS CECIL FIELD
5090.3a

PLAN OF ACTION REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) FOR
OPERABLE UNITS 1, 2 AND 7 (PHASE II) TECHNICAL PROPOSAL VOLUME I OF II NAS
CECIL FIELD FL
6/1/1993
ABB ENVIRONMENTAL

PLAN OF ACTION

**Remedial Investigation/Feasibility Study (RI/FS)
for Operable Units 1, 2, and 7 (Phase II)
Naval Air Station Cecil Field
Jacksonville, Florida**

Technical Proposal, Volume 1 of 2

**Contract No. N62467-89-D-0317
Statement of Work No. 077
Contract Task Order No. 090**

Submitted by:

**ABB Environmental Services, Inc.
2590 Executive Center Circle, East
Tallahassee, Florida 32301**

June 1993

EXECUTIVE SUMMARY

Statement of Work (SOW) No. 077 was issued by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Charleston, South Carolina, on February 1, 1993, to ABB Environmental Services, Inc. (ABB-ES), Tallahassee, Florida. SOW No. 077 describes U.S. Navy Installation Restoration (IR) program at Naval Air Station Cecil Field (NASCF), Jacksonville, Florida. NASCF is a National Priorities List (NPL) site undergoing remedial response processes in accordance with the Superfund Amendments and Reauthorization Act (SARA) of 1986 guidelines, rules, and regulations for Federal facilities. Seven potential source of contamination (PSC) areas are currently being evaluated for threat to human health and the environment. Eight of these PSCs have been grouped into three Operable Units (OUs) because of geographic location, similarity of wastes disposed, and/or remedial alternatives.

SOW No. 077 describes work objectives and requirements that will be awarded as the third in a series of Contract Task Orders (CTOs) for NASCF (N62467-89-D-0317) issued under the Comprehensive Long-term Environmental Action, Navy (CLEAN) District 1 Contract. The purpose of the CLEAN contract is to provide the necessary technical services to accomplish the work efforts identified in a CTO. This document, known as a Plan of Action (POA), has been prepared in response to SOW No. 077 and will specifically support: the Remedial Investigations, Risk Assessments, Feasibility Studies, and Treatability Studies at OUs 1, 2, and 7 and PSC 4; removal design plans and specifications at OUs 6 and 7; basewide ecological requirements; and Federal and State regulatory issues. Community Relations support will also be provided.

Obligation of Defense Environmental Restoration Account (DERA) funds is required for the execution of the work tasks described in this POA. The POA was prepared as required under the CLEAN contract, Part VII, to meet Federal Acquisition Regulations (FAR) and to define in detail the scope, schedule, and budget. The schedule of tasks to be executed under the CTO is expected to last until July 1995 with substantial completion (>95 percent) by January 1995.

IR program goals at all naval facilities include rapid identification and quick response actions to successfully mitigate effects from uncontrolled hazardous waste releases. ABB-ES will provide technical services and associated support to the Navy as described herein to successfully meet the Navy's IR program goals currently programmed for CTO execution. A summary of estimated work efforts by Task Title and an overview of the work activities is provided in the following Executive Summary Table.

Executive Summary Table Estimated Work Efforts by Task Title

Task No.	Page	Title	Overview of Task
1	6	Project Management	Daily management, regulatory support, community relations, visual aids, and audits
2	11	NPL Site Strategy Program	Master schedule for IR program
3	13	PSC Identification Management, and Implementation	Process development for screening disposal sites
4	14	Site Screening Workplan, OUs 3, 4, 5, and 6	Process development for major site screening work efforts
5	15	Field Operations Management	Daily field activities, SAP revisions, and onsite operations
6	16	RI Field Program, Screening at OUs 2 and 7	Screening programs, drilling, and analytical testing
7	17	RI Field Program, Confirmatory OU 1	Confirmatory programs, drilling, and analytical testing
8	23	RI Field Program, Confirmatory OU 2	Confirmatory programs, drilling, and analytical testing
9	27	RI Field Program, Confirmatory OU 7	Confirmatory programs, drilling, and analytical testing
10	31	RI Field Program, Background Sampling and Ecological Mapping	Confirmatory programs, drilling, analytical testing, and habitat and wetlands mapping
11	36	Data Validation and Management	Data management program, analytical data, and site information
12	38	Baseline Risk Assessment Reports	Human Health and Ecological Risk Assessment
13	46	Remedial Investigations	RI reports, characterization of contamination, fate, and transport
14	54	Treatability Study Workplan Preparation for OU 2	Identify technologies for treatability testing
15	58	Groundwater Treatability Study, OU 7	Pretreatment and carbon adsorption testing
16	60	Feasibility Studies	Feasibility Study reports, alternative analysis, and technology screening
17	71	Interim Removal Action Plan	Plans and specifications for removal action at Site 11, Pesticide Disposal Area
18	79	Site 16 Interim Removal Action	Plans and specifications for removal action at Site 16, Holding Tank and Seepage Pit
19	80	Installation Ecological Assessment Workplan	Develop ecological assessment approach for future studies and regional impact
20	80	Community Relations	Provide proactive community relations support
<p>Notes: NPL = National Priorities List. SAP = Sampling Analysis Plan. IR = Installation Restoration. RI = Remedial Investigation. PSC = potential source of contamination. OU = Operable Unit.</p>			

TABLE OF CONTENTS

Task	Title	Page No.
INTRODUCTION	1
INSTALLATION RESTORATION PROGRAM	2
STATEMENT OF WORK EVALUATION AND WORK BREAKDOWN STRUCTURE	3
TASK IDENTIFICATION AND COST REPORTING	4
SCOPE OF SERVICES AND FEE ITEMIZATION	6
TASK 1, PROJECT MANAGEMENT	6
Subtask 1.1, Day-to-Day Task Order Management	6
Subtask 1.2, Project Management Plan (PMP)	7
Subtask 1.3 Regulatory Support	8
Subtask 1.4, Visual Aids (Photography, Graphics, and Video)	9
Subtask 1.5, Meetings (Non-Activity Specific Meetings)	10
Subtask 1.6, Audits	10
TASK 2, NATIONAL PRIORITIES LIST (NPL) SITE STRATEGY PROGRAM	11
Subtask 2.1, Development of Regulatory Strategy	11
Subtask 2.2, Prepare Master Schedule for Long-Range Projections	12
TASK 3, POTENTIAL SOURCE OF CONTAMINATION (PSC) IDENTIFICATION, MANAGEMENT, AND IMPLEMENTATION	13
Subtask 3.1, Process Development	13
Subtask 3.2, Report Preparation	14
TASK 4, SITE SCREENING WORKPLAN, OPERABLE UNIT (OUs) 3, 4, 5, AND 6	14
Subtask 4.1, Historical Information Review	14
Subtask 4.2, Develop Conceptual Models	15
Subtask 4.3, Site Screening Workplan Preparation	15
TASK 5, FIELD OPERATIONS MANAGEMENT	15
Subtask 5.1, Daily Activities	15
Subtask 5.2, Revise Sampling and Analysis Plan	16
TASK 6, REMEDIAL INVESTIGATION (RI) FIELD PROGRAM, SCREENING AT OU 2 AND OU 7	16
Subtask 6.1, Site Screening, OU 2	16
Subtask 6.2, Site Screening, OU 7	17
TASK 7, RI FIELD PROGRAM, CONFIRMATORY OU 1	17
Subtask 7.1, Soil Sampling	18
Subtask 7.2, Monitoring Well Installation	18
Subtask 7.3, Groundwater Sampling	18
Subtask 7.4, Surface Water and Sediment Sampling	18
Subtask 7.5, Biological Sampling	18
Subtask 7.6, Surface Soil Sampling	23
Subtask 7.7 Analyses	23

TASK 8, RI FIELD PROGRAM, CONFIRMATORY OU 2	23
Subtask 8.1, Soil Sampling	24
Subtask 8.2, Monitoring Well Installation	24
Subtask 8.3, Groundwater Sampling	24
Subtask 8.4, Surface Water and Sediment Sampling	24
Subtask 8.5, Biological Sampling	25
Subtask 8.6, Surface Soil Sampling	27
Subtask 8.7, Analyses	27
TASK 9, RI FIELD PROGRAM, CONFIRMATORY OU 7	27
Subtask 9.1, Soil Sampling	27
Subtask 9.2, Monitoring Well Installation	28
Subtask 9.3, Groundwater Sampling	28
Subtask 9.4, Surface Water and Sediment Sampling	28
Subtask 9.5, Biological Sampling	28
Subtask 9.6, Surface Soil Sampling	30
Subtask 9.7, Analyses	30
Subtask 9.8, Aquifer Performance Testing	30
TASK 10, RI FIELD PROGRAM, FACILITY-WIDE SAMPLING AND ECOLOGI- CAL MAPPING	31
Subtask 10.1, Soil Sampling	32
Subtask 10.2, Monitoring Well Installation	32
Subtask 10.3, Groundwater Sampling	32
Subtask 10.4, Wetlands Assessment and Mapping	32
Subtask 10.5, Habitat Mapping	33
Subtask 10.6, Water Level Measurement	34
Subtask 10.7, Installation Restoration Well Location Map	34
Subtask 10.8, Location Survey	35
Subtask 10.9, Facility-Wide Installation Restoration (IR) Program Monitoring Well Maintenance	35
TASK 11, DATA VALIDATION AND MANAGEMENT	36
Subtask 11.1, Data Validation	37
Subtask 11.2, Data Management	37
Subtask 11.3, U.S. Environmental Protection Agency (USEPA) and Florida Department of Environmental Regulation (FDER) Data Reporting	38
TASK 12, BASELINE RISK ASSESSMENT REPORTS	38
Subtask 12.1, OU 1 Baseline Risk Assessment	38
Subtask 12.2, OU 2 Baseline Risk Assessment	44
Subtask 12.3, OU 7 Baseline Risk Assessment	45
TASK 13, REMEDIAL INVESTIGATIONS	46
Subtask 13.1, Remedial Investigation for OU 1	52
Subtask 13.2, Remedial Investigation for OU 2	54
Subtask 13.3, Remedial Investigation for OU 7	54
TASK 14, PREPARE A TREATABILITY STUDY WORKPLAN FOR OU 2	54
Subtask 14.1, Identify Technologies for Treatability Testing	55
Subtask 14.2, Prepare Treatability Study Workplan	56
TASK 15, GROUNDWATER TREATABILITY STUDY, OU 7	58
Subtask 15.1, Mobilization and Demobilization	59
Subtask 15.2, Execute Treatability Study	59
Subtask 15.3, Data Management and Evaluation	59
Subtask 15.4, Residuals Management	59

Subtask 15.5, Treatability Study Report	59
TASK 16, FEASIBILITY STUDIES	60
Subtask 16.1, Feasibility Study for OU 1	60
Subtask 16.2, Feasibility Study for OU 2	67
Subtask 16.3, Feasibility Study for OU 7	69
TASK 17, INTERIM REMOVAL ACTION PLAN, POTENTIAL SOURCE OF CONTAMINATION (PSC) 11	71
Subtask 17.1, Conduct a Focused Feasibility Study (FFS)	71
Subtask 17.2, Responsiveness Summary	75
Subtask 17.3, Develop An Interim Record of Decision (IROD)	75
Subtask 17.4, Plans and Specifications for Removal Action at PSC 11	77
TASK 18, OU 7, PSC 16 INTERIM REMOVAL ACTION	79
TASK 19, FACILITY ECOLOGICAL ASSESSMENT WORKPLAN	79
Subtask 19.1, Develop Facility Ecological Assessment Approach	80
Subtask 19.2, Prepare Draft Workplan	80
Subtask 19.3, Respond to Comments	80
Subtask 19.4, Prepare Final Workplan and Draft Assessment Report	80
TASK 20, COMMUNITY RELATIONS	80
PROJECT PERSONNEL AND ORGANIZATIONAL CHART	83
PERFORMANCE CRITERIA AND MONTHLY EVALUATION	86
SCHEDULES	87
BASIS FOR COST	88
APPENDICES	
Appendix A: Statement of Work	
Appendix B: Cost Summary	
Appendix C: Schedule	
Appendix D: Monthly Evaluation Form	

List of Figure

Figure	Title	Page No.
1	Organizational Chart	84

List of Tables

Table	Title	Page No.
1	Number of Locations for Aquatic Macroinvertebrate and Fish Sampling, OUs 1, 2, and 7	19
2	Sediment and Soil Toxicity Testing, Operable Units 1, 2, and 7	21

List of Exhibits

Exhibit	Title	Page No.
1	Feasibility Study	61
2	Nine Criteria for Detailed Analysis	62
3	Feasibility Study Report Outline	65
4	Focused Feasibility Study Outline	72
5	Interim Action Record of Decision (ROD) Format	76

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
ACS	Automated Compliance System
AIMD	Aircraft Intermediate Maintenance Department
APT	Aquifer performance testing
ARARs	Applicable or Relevant and Appropriate Requirements
ASTM	American Society for Testing and Materials
bls	below land surface
BRA	Baseline Risk Assessment
CAAA	Clean Air Act Amendments
CAD	computer assisted drafting
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-term Environmental Action, Navy
COCs	contaminants of concern
CR	Community Relations
CSF	cancer slope factors
CSI	Construction Specifications Institute
CTOs	Contract Task Orders
CWA	Clean Water Act
DERA	Defense Environmental Restoration Account
DNAPL	dense non-aqueous phase liquid
DOD	Department of Defense
EA	Ecological Assessment
EAM	Ecological Assessment Methodology
ECAO	Environmental Criteria and Assessment Office
EE/CA	Engineering Evaluation and Cost Analysis
EIC	Engineer-in-Charge
ENSAFE	Environmental and Safety Designs, Inc.
FAR	Federal Acquisition Regulations
FDER	Florida Department of Environmental Regulation
FFA	Federal Facility Agreement
FFS	Focused Feasibility Study
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FNAI	Florida Natural Areas Inventory
FOL	Field Operations Leader
FS	Feasibility Study
GC	gas chromatograph
GPS	Global Positioning Survey

HASP	Health and Safety Plan
HEAST	Health Effects Assessment Summary Tables
HHRA	Human Health Risk Assessment
HHRAM	Human Health Risk Assessment Methodology
HTRW	hazardous, toxic, and radiological waste
IDW	investigation-derived wastes
IR	Installation Restoration
IRC	Installation Restoration Coordinator
IRIS	Integrated Risk Information System
LOE	level of effort
LOW	limits of work
MS/MSD	Matrix spike/matrix spike duplicate
NAD	North American Datum
NASCF	Naval Air Station Cecil Field
NCP	National Oil and Hazardous Substances Contingency Plan
NEESA	Naval Energy and Environmental Support Activity
NEPA	National Environmental Policy Act
NFA	no further action
NGS	National Geodetic Survey
NPL	National Priorities List
NRPM	Naval Remedial Project Manager
NRT	Natural Resource Trustee
NTP	notice to proceed
NWI	National Wetlands Inventory
ODCs	other direct costs
OSHA	Occupational Safety and Health Administration
OU _s	Operable Units
PAO	Public Affairs Officer
PCBs	polychlorinated biphenyls
PET	Project Execution Team
PP	proposed plan
PMO	Project Management Office
PMP	Project Management Plan
POA	Plan of Action
PSC	Potential Source of Contamination
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
RA	Risk Assessment
RAC	Remedial Action Contract
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design/Remedial Action
RfDs	reference doses
RI	Remedial Investigation
ROD	Record of Decision

SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SMP	Site Management Plan
SOUTHNAV- FACENCOM	Southern Division, Naval Facilities Engineering Command
SOW	Statement of Work
SSWP	Site Screening Workplan
SVOAs	semivolatile organic analytes
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TD	Technical Director
TFMR	Technical and Financial Monthly Report
TICs	tentatively identified compounds
TM	technical memorandum
TMSS	Technical Memorandum for Supplemental Sampling
TOC	total organic carbon
TOM	Task Order Manager
TSCA	Toxic Substances Control Act
TPH	total petroleum hydrocarbon
TRC	Technical Review Committee
TSD	Temporary Storage and Disposal
TSWP	Treatability Study Workplan
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UV	ultraviolet
VOAs	volatile organic analytes
WBS	Work Breakdown Structure
WWTP	wastewater treatment plant

INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), is under contract to the Department of the Navy to provide environmental consulting and engineering related services to naval facilities throughout the southeastern United States. This Comprehensive Long-term Environmental Action, Navy (CLEAN) contract is a Task Order Contract administered by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) located in Charleston, South Carolina. SOUTHNAVFACENGCOM is responsible for execution of the Navy's Installation Restoration (IR) program throughout the southeastern United States. The IR program is intended to mitigate potential threats to human health and the environment resulting from past disposal practices of hazardous wastes. Naval Air Station Cecil Field (NASCF) has been identified as a National Priorities List (NPL) site under the Superfund Amendments and Reauthorization Act (SARA), 1986, where Remedial Investigations (RIs) and Feasibility Studies (FSs) have begun at several potential sources of contamination (PSC) comprising Operable Units (OUs) 1, 2, and 7. An OU is one or more PSCs at which Remedial Investigation and Remedial or Removal Action can proceed.

The purpose of this document, known as a Plan of Action (POA), is to present in detail the scope of services, the schedule, and budget programmed for execution of the Navy's Statement of Work (SOW) No. 077, Contract No. N62467-89-D-0317, RI/FS for OUs 1, 2, and 7 (Phase II). The SOW was issued to ABB-ES on February 1, 1993. This POA is the controlling document for task order execution; it documents the basis for final negotiations and is the document by which performance is measured.

This Technical Proposal (Volume 1 of 2) presents the scope, schedule, budget, and cost summary. A separate Cost Proposal (Volume 2 of 2) presents detailed costs and backup information.

INSTALLATION RESTORATION PROGRAM

The IR program at NASCF currently has 19 PSCs programmed for investigations to determine potential threat to human health and environmental impacts. Three OUs (1, 2, and 7) and one additional PSC (No. 4) are currently under investigation. Phase I of the investigation was completed through execution of previously issued Contract Task Orders (CTOs).

CTO No. 002 was issued January 1991, to review previously written workplans for NASCF and to revise and/or prepare new workplans to submit to the U.S. Environmental Protection Agency (USEPA) and Florida Department of Environmental Regulation (FDER) for approval. Implementation of the final Workplan for OUs 1, 2, and 7 was initiated under CTO No. 035. The approved Workplan was proposed to identify and characterize the source of contamination at OUs 1, 2, and 7; and delineation of groundwater contamination was not included in the original scope.

Field work began in October 1991 in accordance with CTO No. 035 and validated analytical results were available in March 1992. Review and evaluation of these data indicated that contamination at many of the sites did not reflect the volume or variety of wastes originally suspected. Additionally, at this time USEPA suggested that the Navy concurrently delineate groundwater contamination. The combination of data gaps and investigative scope revisions for OUs 1, 2, and 7 resulted in the requirements for expanded remedial investigations to satisfactorily meet USEPA and FDER requirements for RI, Risk Assessment (RA), and FS reports.

A Technical Memorandum for supplemental sampling at OUs 1, 2, and 7 was prepared and submitted to the regulatory agencies in September 1992 to address additional investigative requirements. A Field Screening Program was initiated in accordance with these documents in early February 1993. The work identified in this POA will complete field screening and confirmatory sampling outlined in the Technical Memorandum. RI/FS reports will also be prepared and Removal Action Plans and Specifications will be developed for two PSCs.

STATEMENT OF WORK EVALUATION AND WORK BREAKDOWN STRUCTURE

For all SOWs received from the Navy, a task definition narrative is prepared that includes ABB-ES' understanding of the requirements, the methods and techniques to be used for the work, required testing procedures, a budget, and a detailed delivery schedule.

ABB-ES has developed a functional Work Breakdown Structure (WBS) to identify the tasks required for execution of the SOW. This effort involves identifying the necessary work elements for the accomplishment of each of the tasks at the lowest level of the functional WBS. The functional WBS specifies the time relationship between the work elements and deliverable milestones for performance and depicts a complete set of scheduling requirements or constraints.

The labor estimates for the WBS depend upon the following factors:

- type of task,
- amount and quality of existing task documentation,
- team experience with the task,
- tools available for task performance support, and
- amount and quality of customer interaction time.

A manpower loading schedule, which identifies the labor categories required over time to accomplish a CTO by the Navy's request date, is then developed.

Each Task Order Manager (TOM) has specific plans, schedules, and budgets to follow that are derived from the WBS. This places responsibility at a level where it can be responsive and closely controlled. TOMs will identify and coordinate specific task responsibilities to facilitate interaction with corresponding Navy personnel.

The TOM is responsible for maintenance of project budgets and cost reporting. The monthly Technical and Financial Monthly Report (TFMR) prepared for submission to the Navy identifies expenditures by WBS tasks and variances from budget. During this period, the TOM will meet with the Program Manager to review expenditures and identify problem areas. When the cost report is submitted to the Navy, WBS cost elements will have been examined to determine if variances indicate either a cost growth or schedule slippage, potential problems, corrective action to be taken, and expected date by which the problems should be resolved. Any problems that appear significant enough to affect final delivery or cost are reported to the Navy.

TASK IDENTIFICATION AND COST REPORTING

Tasks presented in the SOW (Appendix A) were reviewed, evaluated, and broken down in accordance with the WBS described above. The POA Scope of Services was then developed by identifying tasks corresponding to the WBS. All tasks requested in the SOW are incorporated in the POA tasks as described in the following lists comparing SOW and POA tasks.

SOW Task		POA Task
<u>Section</u>	<u>Task</u>	
5.0	RI/FS	
	5.1	1
	5.2	5, 6, 7, 8, 9, 10
	5.3	11.1, 11.2
		12, 13, 16
6.0	Miscellaneous Field Work	
	6.1	2
	6.2	7.5, 8.5, 9.5, 10.4, 10.5
	6.3	10.9
	6.4	10.6
		10.7
7.0	Treatability Studies	
	7.1	6
	7.2	15
		14
8.0	Project Management Support	
	8.1	8
	8.2	1.1
	8.3	9
	8.4	1.6
	8.5	10
	8.6	3
	8.7	16
	8.8	11
	8.9	12
		18
		13
		1.3
		1.1
		1.5, 2.2
		2.1
9.0	Workplans	
	9.1	17
	9.2	4
		19
10.0	Removal Actions	
	10.1	19
	10.2	17.1, 17.2, 17.3
		17.4
11.0	Data Reporting	
	11.1	21
		11.3

SOW Task		POA Task
<u>Section</u>	<u>Task</u>	
12.0	Community Relations	
12.1	22	20
12.2	23	20
12.3	24	20
12.4	25	20
12.5	25	20
12.6	26	20
12.7	27	20
12.8	28	20

In some cases, SOW tasks may be identified with two or more POA tasks. To the extent possible, costs associated with each POA task or subtask have been isolated to facilitate comparison of proposed costs with the government estimate.

The POA tasks were developed to combine similar WBS activities and to assist future accounting of remedial investigation and remedial actions at the specific OU level. The various POA tasks can be grouped into three broad areas:

Project Management	Remedial Investigation/ Feasibility Study	Removal/Remedial Action
OU 1, 2, 7	5, 11	
OU 1	7, 12.1, 13.1, 16.1	
OU 2	6, 8, 12.2, 13.2, 16.2	14, 18
OU 7	6, 9, 12.3, 13.3, 16.3	15
Installation	3, 10, 19	
Other	4	17
All of the above	1, 2	

Most of the POA tasks are grouped under RI/FS, which is appropriate at this stage of the IR program. However, removal or remedial actions are also programmed in accordance with the SOW. As can be seen in the above listing, POA tasks can be readily used to report RI/FS costs separately from removal and remedial action. The POA tasks can also be used to track each of these two broad categories of cost by individual OU.

SCOPE OF SERVICES AND FEE ITEMIZATION

The purpose of this section is to clearly define the scope and assumptions made for this fee proposal should it be necessary to enact provisions delineated in Part VII, paragraph 22, of the subject contract in accordance with Federal Acquisition Regulations (FAR) 52.243-2.

Specific Parameters:

As outlined specifically in Tasks 1 through 20.

Period of Performance Parameters:

Costs presented are estimated to be incurred through April 1995 with substantial completion (>95 percent) by November 1994.

The estimated budgets for performance of the technical scope of services as stated below are contained in Appendix B. Detailed cost information is contained in Volume 2 of this POA. The text may also provide rationale for cost estimating and, when cross-referenced with Volume 2, will provide the basis for estimating the project budget. Task schedules are presented in Appendix C.

All tasks associated with field work have a level of effort (LOE) based on three field personnel. One of these is the Field Operations Leader (FOL). LOE was scoped in this manner to better track costs associated with individual tasks.

TASK 1, PROJECT MANAGEMENT. ABB-ES will conduct or provide the project management activities necessary to meet the project's objectives as indicated in the Navy's SOW No. 077.

In general, this includes:

- Task Order estimating and scheduling;
- Task Order assignments, monitoring, and control;
- Task Order reporting and record management;
- Task Order Quality Assurance (QA);
- Task Order inspection and audit program; and
- Task Order changes, cost variance, and estimates to complete.

ABB-ES will support the Navy at regulatory meetings and provide or assist the Navy with written materials to address comments the regulatory agencies and others may have concerning the Navy's RI/FS process. Presentation materials in support of Community Relations activities and other associated visual aids such as graphic, photographic, and video documentation will also be provided as part of this task.

The following subtasks describe the services and/or products to be provided under Task 1.

Subtask 1.1, Day-to-Day Task Order Management The execution of work under this POA is estimated to require approximately 24 months to complete with substantial completion of work (>95 percent) by November 1, 1994. Full-time project management functions will be required for successful execution of the scope of services. The day-to-day and month-to-month activities include internal monitoring of Task Order progress, review of the products under development, selection and coordination of subcontract work efforts, and resolution of conflicts or problems that may arise.

To effectively monitor ongoing tasks, the ABB-ES TOM will have the authority and responsibility for the overall performance of the technical tasks described within this POA. The TOM will maintain liaison with the responsible Navy representatives to ensure that priorities remain current and Task Order status and visibility are provided by identifying progress realized, any deviations from the internal project milestones, and potential problem areas. All task work will follow existing programming, documentation, and QA standards and procedures that have been established for the CLEAN contract.

TFMRs will be prepared and submitted on a monthly basis, formatted as required under the contract. These reports will include:

- task schedule status (actual versus planned),
- percentage of labor expended to date (actual versus planned),
- milestones and interim deliverables achieved,
- problem areas with recommended solutions, and
- anticipated work for the next reporting period.

Other formal and informal means of communication will also take place as the Project Team works closely with the Navy representative.

Subordinate activities including administrative support, file management, telefaxing, telephone communications, and other inherent duties performed by support personnel will be executed.

A full-time TOM will be supported by a full-time Project Assistant. Additional key team members and other administrative and support personnel in both onsite and offsite locations will also be used to provide the day-to-day functions necessary to carry out execution of this POA.

Subtask 1.2, Project Management Plan (PMP) Because of the size and complexity of the IR program at NASCF, it is necessary for the project personnel to be thoroughly familiar with the requirements and conditions of the Federal Facility Agreement (FFA) for NASCF and the schedules as outlined in the Site Management Plan (SMP). Key staff personnel required to provide short- and long-term planning and to implement the technical and administrative functions will be identified as members of a Project Execution Team (PET). This team will take the projects from site screening to site remediation and subsequent delisting from the NPL. Currently, seven OUs have been identified at NASCF, and potentially there are more. Because RIs for several OUs may be done concurrently, or at least overlap, it is necessary to manage multi-discipline resources so they are available when needed to provide oversight and input to the various RIs. The PMP will evaluate existing project management tasks that are currently used by ABB-ES and the Navy in efforts to develop more effective and efficient means to support the Naval Remedial Project Manager's (NRPM) needs.

ABB-ES will prepare the PMP for NASCF in phases in accordance with the Navy's requirements. ABB-ES will develop Phase I of the PMP at this time. Subsequent phases will be designed and developed as deemed necessary and as directed by the NRPM.

Phase I of the PMP will accomplish, at a minimum, the following:

- specify the purpose of the PMP (a kickoff meeting will be held),
- define the role of the PET,

- identify the members of the PET,
- identify specific duties for each PET as they relate specifically to the IR program at NASCF,
- identify other key personnel who may be required during the execution of a project,
- provide brief resumes for the PET and other technical personnel,
- develop wire diagrams that include project job designation and responsible personnel (i.e., RI, FS, Community Relations (CR), data evaluation, project management, contractual management)
- include a table of contents to the PMP,
- incorporate the SMP into the PMP,
- incorporate the NPL site strategy program to be developed under Task 2.

The PMP should be prepared as a Draft and Final document. The Draft shall be presented to the NRPM and NASCF IR Coordinator for review. Following addressing of comments from the Navy, the Final PMP shall be prepared and distributed as directed by the NRPM.

Duration. The PMP would be completed by the end of the 1993 fiscal year.

Subtask 1.3 Regulatory Support The IR program is affected by many different Federal regulatory requirements including the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Toxic Substances Control Act (TSCA), National Environmental Policy Act (NEPA), Clean Air Act Amendments (CAAA), Clean Water Act (CWA), Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and Safe Drinking Water Act (SDWA) as well as interagency agreements such as the FFA developed for NASCF. The FFA represents the framework for IR program activities at NASCF and the interactions with and responsibilities of the three parties to the agreement:

- Navy,
- USEPA, and
- FDER.

This subtask provides resources for supporting the NRPM in matters related to regulatory compliance and implementation of the FFA provisions that are not otherwise provided for in specific tasks of this POA.

Typical support activities to be conducted under this task include summarizing and relating the scientific and engineering effect of new regulations and legislation on the IR program at NASCF, providing the NRPM with technical expertise at meetings regarding compliance with regulations and conditions of agreements, and providing the NRPM with administrative and technical support in evaluating and demonstrating compliance with requirements associated with IR program activities. Such support may include preparation of documents and presentations, meeting organization and notes, graphics, file search and review, document review and evaluation, and development of issue and position papers.

An ongoing FFA compliance activity to be supported by the subtask includes dispute resolution regarding deliverables to USEPA. Specific support activities already completed included preparation of administrative and historical records, drafting of a position paper, and participation in strategy development meetings.

To estimate the LOE and costs associated with this subtask, the following activities are assumed to occur at least once:

Dispute Resolution Support

- update administrative record once
- review one USEPA position paper
- prepare, in a letter report, recommendations for resolving the dispute
- prepare, in a letter report, recommendations to prevent future disputes
- participate in one strategy development meeting
- prepare a set of 10 overheads, and an outline (annotated) of a presentation stating the Navy's position

Regulatory Analysis

- prepare a summary of a recently promulgated set of requirements for hazardous waste and the effect the new regulations will have on the NASCF IR program

No activity will occur under this subtask without written direction by the NRPM.

Subtask 1.4, Visual Aids (Photography, Graphics, and Video)

Visual Aids

Throughout the course of this project, both planned and unplanned incidents may arise that will require the presentation of project updates and progress to Navy organizations, State and Federal Agencies, the Technical Review Committee (TRC), Natural Resource Trustees (NRT), and the general public. To be prepared for these presentations and meeting, visual aids will be developed. The following presentation materials will be developed or prepared for these purposes:

- a photograph album consisting of approximately 200 photographs from the field investigation,
- 25 enlarged mounted photographs of historical aerial conditions and field investigation,
- 25 overhead presentation materials, and
- a 30-minute video.

Subtask 1.5, Meetings (Non-Activity Specific Meetings) ABB-ES shall attend and prepare for non-activity meetings in support of the project and is responsible for recording minutes of meetings. Copies of minutes shall be distributed to the NRPM and other attendees within 15 working days of the meeting date. The types of meetings anticipated to be required each year will include the following:

- TRC meetings,
- CR events,
- planning meetings (July of each year),
- monthly progress meetings,
- bi-monthly NRPM meetings,
- NRT meetings, and
- PET meetings (one every 3 months).

Significant resources are associated with meetings and are at risk if the meeting is not focused, organized, and conducted in a deliberate manner. To assist the TOM in managing resources for internal meetings, meeting agendas (including objectives, specific items to be addressed, and schedule) will be prepared prior to the meeting, and action items and conclusions will be identified at the end of the meeting.

<u>Meeting</u>	<u>Number of Meetings</u>
TRC meetings	3
CR meetings	4
Planning meeting	1
Progress meetings	12
RPM meetings	12
NRT meetings	2
PET meetings	6

Subtask 1.6, Audits A proper level of QA is necessary for each deliverable and product specified in the Task Order. Current ABB-ES procedures and guidelines are used to specify the QA activities to be performed for Task Order products. This approach ensures that the Navy will receive consistent, quality products that meet established QA standards.

The ABB-ES internal audit and inspection program will be used to evaluate compliance with procedures that guide the development and organization of products, schedules, progress and status reporting, conduct of technical work, and standards. The major goals of these audits will be to identify the general quality of work being performed and to determine whether the requirements for the work are in conformance. Any nonconformances that may be identified will be reported on a Report of Nonconformance, and a plan for resolving the nonconformance will be submitted to the Corporate QA Manager by the TOM within 30 days of the audit report. If the nonconformance shows evidence of a fundamental breakdown in quality activities that can only be corrected effectively by stopping work, a Stop-Work Notice will be issued by the QA Manager and the Vice President for Total Quality Management of ABB-ES.

The goals of the internal audit and inspection program are to meet the quality objectives of the Navy and to ensure that:

- program plans are used and maintained;

- program documentation is timely and thorough, and meets Task Order requirements;
- reviews are completed before moving into subsequent phases;
- baselines are established and controlled; and
- published standards and procedures are followed.

The QA Manager or his designee will direct the inspections and audits over the course of this project and provide recommended improvements to the project team. It is anticipated that two office and two field audits will be conducted.

It is anticipated that the USEPA and FDER will also conduct field audits, and ABB-ES will be onsite to answer questions and provide support to the Navy as required. Assuming the duration of the field program to be 10 months, three regulatory audits are anticipated. The RI Technical Leader and FOL will support this effort.

TASK 2, NATIONAL PRIORITIES LIST (NPL) SITE STRATEGY PROGRAM. NASCF, as a CERCLA NPL Site, has entered into an FFA with the USEPA and the FDER. PSCs have been identified at the facility that need to undergo remedial response consistent with the FFA. Twelve of these PSCs have currently been arranged into seven CERCLA OUs. Because of the many activities (both administrative and technical) required to meet the objectives of the FFA and Navy IR program at NASCF, a NPL Site Strategy Program will be implemented to provide continuous review of progress at all PSCs.

The initial program will be executed through December 1993, at which time a status review will be conducted and future requirements identified to continue the process.

Subtask 2.1, Development of Regulatory Strategy The IR program at NASCF is complex by nature, and there is a need to develop a regulatory strategy that addresses key program elements to locate, identify, and remediate environmental contamination from past disposal practices.

The interagency agreements with the USEPA and FDER require successful coordination and administration of the various activities associated with the IR program to meet mutually acceptable goals, milestones, and schedules, which are outlined in the yearly SMP. A regulatory strategy will be identified to provide short- and long-term planning and to implement the technical and administrative functions necessary to take disposal sites from the site screening process through site remediation and subsequent delisting from the NPL.

The goal of this strategy will be to meet or exceed the FFA and yearly SMP requirements while taking into consideration the current regulatory disputes, providing for sound technical decisions for site investigations and early removal actions, and considering cost-effective measures for implementation of project schedules.

1. The basic requirements for this strategy are to:
 - a. conform to Navy procedures,

- b. address regulatory requirements throughout the installation that may impact the IR program,
- c. be dynamic and flexible such that it can be added to or modified as new or changing requirements or conditions are identified, and
- d. bring continuity and consistency to the remedial investigations and clean-up measures performed as part of the IR program at NASCF.

The strategy will be developed by the TOM, Technical Director (TD), Program Manager, and other members of the PET and in close coordination with the NRPM. Key points of the strategy will be development and maintenance of cooperation, open and frank communication, and trust between the FFA parties. Whereas the strategy will focus on administrative policy and regulatory issues and constraints, it will also address strategic technical issues such as Human Health and Ecological Risk Assessment methodologies, innovative technologies, and treatability studies to reduce costs and accelerate schedules for completing the IR program.

Administrative issues such as accelerating remedial and removal actions while maintaining remedial investigations under limited resource allocations will be recognized as particularly critical to achieving strategic goals. The strategy will be developed over a 12-month period. An initial kickoff meeting to refine objectives and strategic goals will be held with the NRPM. Three quarterly progress reports and a draft strategy will be provided to the NRPM.

As part of the investigative IR site support, ABB-ES will use GIS/Key™ to assist in data evaluation at each site. This software program, which has been purchased by Project Management Office (PMO), integrates data and graphics from which the following can be generated: geologic cross sections, boring logs, potentiometric maps, isopleth maps, structure maps, summary tables, hydrographs, chemical time series graphs, and line graphs.

For the seven sites in Investigative Set I, this task will require 100 hours per site. This includes data input, file management, evaluation, and results output.

Subtask 2.2, Prepare Master Schedule for Long-Range Projections Continuous review of the IR program schedule at NASCF is considered essential for successful execution of the various elements of work. A master schedule will be developed that identifies activities currently planned to be executed under this POA, anticipated activities that may be required to satisfy regulatory requirements, SMP goals or milestones, and projected activities to support long-range planning. This master schedule will:

- incorporate the SMP;
- provide a detailed schedule of all primary and secondary deliverables;
- indicate time frames for major events such as field work, laboratory analysis, data validation, and report writing;
- include the schedule for meetings;
- be easily updated on at least a quarterly basis to show the historical as well as future requirements of the program; and

- identify critical activities that prevent schedule acceleration.

The Primavera™ scheduling system will be used as the software tool for reporting purposes to the Navy. Once developed, it is anticipated the schedule will be included in progress reports to the NRPM as described in Subtask 1.1.

TASK 3. POTENTIAL SOURCE OF CONTAMINATION (PSC) IDENTIFICATION, MANAGEMENT, AND IMPLEMENTATION. Preparation of a process document for the identification and management of new PSCs will be completed pursuant to Section 8.3 of the Statement of Work dated February 1, 1993. This task will consist of two subtasks:

Subtask 3.1, Process Development; and
Subtask 3.2, Report Preparation.

Subtask 3.1, Process Development The objective of this task is to develop a process for evaluating potential hazardous materials or waste spill storage or disposal areas at NASCF. The process will be used to evaluate if these suspect areas should be elevated to PSC status or be formally removed from consideration by the IR program. To be evaluated, information must be collected on each suspect area based on record searches, site observations, and measurements. The evaluation process must be objective and protective of human health and the environment. The decision to include a suspect area in the IR program represents a significant (up to several million dollars) administrative and technical cost burden.

Because of the number of suspect areas to be considered, it will be necessary to incorporate in the process a prioritization protocol for their management. This protocol will identify the order in which suspect areas are to be evaluated based on the protection of human health and the environment.

The strategy to be used during the evaluation of the suspect areas will be outlined in the process document. This strategy will consist of ABB-ES' technical approach for accomplishing the objectives of the evaluation process in a cost-effective and timely manner. Requirements for implementing the process outlined (i.e., resources per suspect area, duration of the process, data quality objectives for any analytical sampling) will also be included.

In addition to prioritizing the known suspect areas for evaluation, the process will be developed based on the requirements and procedures for regulatory notification. Following the evaluation of each area, as one of the last steps of the process, a recommendation will be made whether to include the area as a PSC in the IR program or to remove the area from further consideration. It is anticipated that the Navy will be required to notify and provide supporting rationale and documentation for regulatory agencies regarding suspect area decisions.

To develop a process that meets the conditions and needs of NASCF, a meeting will be held at NASCF to discuss and focus the objectives and approach of this task with the NRPM, the TOM, the TD, and the Engineers and Scientists responsible for the process. Prior to the meeting, regulation reporting and notification requirements will be identified and summarized by ABB-ES. Following the meeting, the process will be developed using decision trees, logic diagrams, regulatory requirements, and agency policies and guidelines. At 75 percent complete, the developed process will be presented and discussed with the NRPM. Adjustments to the process will be made based on the conclusions of the meeting.

Following development of the process, it will be verified by using it at three PSCs (suspect areas already in the IR program that are known to present a threat to human health or the environment). The process

will also be applied at three areas known to not contain hazardous waste to evaluate the ability of the process to distinguish between areas possibly requiring remedial action and those areas that do not.

Subtask 3.2, Report Preparation This subtask includes the preparation of the process document. Logic diagrams and rationale tables (as appropriate) will be prepared to assist in the presentation of information contained in the process document. The document will also include sample evaluation forms to summarize suspect area information, evaluation criteria, and results and present recommendations and notification requirements.

The process document will be submitted for internal ABB-ES technical review and modified pursuant to those comments. A draft document will be prepared and submitted to the NRPM and to NASCF. Upon receipt of NRPM and NASCF comments, a final document will be prepared and submitted to the NRPM and NASCF.

TASK 4, SITE SCREENING WORKPLAN, OPERABLE UNIT (OUs) 3, 4, 5, AND 6. Preparation of a Site Screening Workplan (SSWP) will be completed pursuant to Section 9.1 of the Statement of Work No. 77. This task will consist of three subtasks:

- Subtask 4.1, Historical Information Review;
- Subtask 4.2, Develop Conceptual Models; and
- Subtask 4.3, Site Screening Workplan Preparation.

Subtask 4.1, Historical Information Review The first activity to be completed in the preparation of the SSWP will be a detailed review of available historical and current information. Understanding of each OU's history and existing conditions is essential to the development of an effective workplan. The review will focus on gathering data on the types and quantities of wastes or materials handled or disposed at each of the OUs. In addition to waste types and quantities, information concerning the methods and locations used for the waste handling and disposal will be gathered. Accumulation of this information will guide the development of a conceptual model for each OU.

The primary sources of information that will be queried are listed below:

- Initial Assessment Study (NEESA, 1985);
- Draft Final RCRA Facilities Investigation Report (Harding Lawson Associates, 1988);
- Draft RI/FS Workplan OUs 3, 4, 5, and 6 (ABB-ES, February 1992);
- regulatory comments to the Draft RI/FS Workplan OUs 3, 4, 5, and 6;
- historical aerial photographs;
- U.S. Geological Survey (USGS) modeling efforts;
- hydraulic data from adjacent OUs; and
- interviews with NASCF personnel (if available).

Review of available information from the above sources is necessary to develop a viable and functional conceptual model for each OU considered. The sources will provide the necessary analytical and physical information on the OUs as well as an understanding of regulatory emphasis and concerns.

Hydraulic data from ongoing investigations at other OUs (primarily aquifer recognition and/or division information) and from the on-going USGS modeling efforts will be briefly reviewed. This review will ensure that planned screening activities for OUs 3, 4, 5, and 6 are compatible and consistent with the

information being developed for the other OUs under consideration by the IR program. This will also facilitate the incorporation of OUs 3, 4, 5, and 6 data into the USGS modeling database.

Subtask 4.2, Develop Conceptual Models Following the review of information from all available sources, conceptual models will be developed for each OU. The conceptual models will be developed using information concerning past waste handling and waste disposal practices, previous sampling information, and knowledge of the fate and transport characteristics of the contaminants known or suspected to be present at the site. The conceptual models will serve as functional guides for identifying data deficiencies in the information existing for each OU. Development of a conceptual model will serve to direct and focus the site screening efforts toward the resolution of data deficiencies so that an effective RI/FS Workplan can be developed for OUs 3, 4, 5, and 6. The objectives of the site screening program will then be developed based on each OU's conceptual model.

Subtask 4.3, Site Screening Workplan Preparation Preparation of the SSWP will follow the review of historical information and the development of conceptual models for each OU. The activities detailed in the SSWP will be designed to resolve specific data deficiencies identified during the development of the conceptual model.

Rationale for each element of the field program will be provided in the SSWP. The SSWP will also identify the technology (i.e., direct-push technology, media sampling) to be used for each element of the screening program. Figures showing the locations at which screening samples and observations will be collected will be presented for each OU. Summary tables outlining the number of samples to be collected, their depths, and the analyses to be completed for each will also be provided in the SSWP.

Prior to the initiation of any site screening activities at OUs 3, 4, 5, and 6, modification of the Cecil Field Health and Safety Plan (HASP) will be required. This modification must be completed to provide for the health and safety of ABB-ES personnel during site screening activities. The existing HASP does not contain adequate provisions for the execution of field activities in the presence of unexploded ordnance. Modification of the HASP will be completed concurrently with the development of the SSWP for OUs 3, 4, 5, and 6 and will be submitted for Navy review and approval in the same package.

The SSWP will be submitted for internal ABB-ES technical review and modified pursuant to those comments. A Draft SSWP will be prepared and submitted to the NRPM and to NASCF. Upon receipt of NRPM and NASCF comments, a Final SSWP will be prepared and submitted to the NRPM and NASCF within 2 weeks.

TASK 5, FIELD OPERATIONS MANAGEMENT.

Subtask 5.1, Daily Activities Management of field operations at NASCF for the completion of the RI/FS for OUs 1, 2, and 7 will be accomplished pursuant to Section 5.1 of SOW No. 77. Work to be completed under Task 5 is not specific to any one OU or site screening effort; therefore, the LOE and other direct costs (ODCs) for management of field operations will be addressed as a separate task. In order to complete the site screening and confirmatory sampling for the RI/FS at OUs 1, 2, and 7, oversight and coordination of field operations is necessary for the overall success of the field program.

Oversight and coordination of field operations will facilitate the completion of all field tasks by ensuring that adequate supplies and materials have been procured and are available for the field crews. These materials include health and safety supplies, decontamination supplies, sampling equipment, field data reporting materials, and sample packaging and shipment materials. A complete list of materials necessary

to supply and equip the field program at NASCF and their associated costs are provided in Volume 2 of this technical proposal.

In addition to the materials necessary for the field crews, communication with and oversight of the various subcontractors present at NASCF are also required for the timely completion of field operations. This includes coordinating subcontracting issues with project management in Tallahassee, with the subcontractors in the field, and with the various management groups for each of the subcontractors. Tracking and documentation of the items and quantities used or completed by each of the subcontractors is also required to monitor invoicing.

Throughout the site screening program (discussed in Task 6) and the confirmatory field program (discussed in Tasks 7 through 10) investigation-derived wastes (IDW) will be generated. These wastes will include soil from soil borings and the installation of monitoring wells, water from the developing and purging of monitoring wells, and personal protective equipment and other disposable items used by ABB-ES field personnel. Management staging, sampling, and analysis of IDW, both soil and groundwater, will be completed as part of the daily activities.

LOE for this task has been estimated assuming that the FOL will spend approximately 2 hours per day, throughout the duration of the program, on oversight and coordination of field operations and the senior field technician will spend approximately 2 hours per week on periodic equipment maintenance.

Subtask 5.2, Revise Sampling and Analysis Plan Because of the size, duration, and complexity of the field activities planned during the current investigation, modification of the existing Sampling and Analysis Plan (SAP) for OUs 1, 2, and 7 is required. The existing SAP details the execution of the field program that was completed in 1991 and is, therefore, out of date. Modification of the SAP is necessary to ensure the consistency and representativeness of the data currently being collected, as several new field elements have been added to the program since the SAP was written (August 1991). New elements that have been added to the field program include: the laboratory analytical sampling program outlined in the Technical Memorandum for Supplemental Sampling (TMSS), site screening of soils and groundwater with an onsite laboratory, dense non-aqueous phase liquid (DNAPL) sampling at OUs 2 and 7, and aquifer performance testing at OU 7. In addition to presenting procedures for the above-mentioned activities, the revised SAP will serve to document the scope and nature of the proposed field activities during field audits conducted, in accordance with the FFA, by State and Federal regulatory agencies. LOE estimates for this subtask have been developed based on experience in the preparation of previous SAPs.

TASK 6, REMEDIAL INVESTIGATION (RI) FIELD PROGRAM, SCREENING AT OU 2 AND OU 7. Site screening will be completed during the current investigation pursuant to Section 5.1 of SOW No. 77. This Task is required to complete the preliminary screening effort at OUs 2 and 7. Screening of soil and groundwater at OU 2 (Sites 3 and 5) and screening of soil at OU 7 (Site 16) has been addressed in the preliminary screening proposal previously submitted to the Navy. Included in the final screening tasks are the groundwater screening to be conducted at OU 7 (Site 16) and the soil and groundwater screening to be conducted at OU 2 (Site 17). Screening at Sites 16 and 17 will be conducted in accordance with the TMSS at OUs 1, 2, and 7.

Subtask 6.1, Site Screening, OU 2 Site screening will be completed at OU 2 prior to the initiation of confirmation sampling (Task 8). Soil and groundwater at Site 17 will be screened using a drilling rig and the onsite analytical laboratory. The site screening methods and objectives are described in the TMSS.

Utility clearance will be obtained for Site 17 before intrusive activities begin. Soil and groundwater will be screened vertically from land surface to approximately 70 feet below land surface (bls). Samples collected will be submitted to the onsite laboratory for analysis of screening parameters. Screening will be conducted at a minimum of 11 unique boring locations and a maximum of 50 boring locations. During the screening, detailed lithologic boring logs from each location will be completed and included in an electronic database for subsequent use and analysis during the remedial investigation report preparation.

Analytical results of the soil and groundwater analyses from the onsite laboratory will be evaluated in the field. Isoconcentration contour maps will be developed using the screening data. These will focus and guide the final selection of soil and groundwater sampling locations during the Confirmation Study. LOE for site screening has been developed assuming that sampling and analysis from one unique boring location can be completed in a day using a two-person field crew.

Subtask 6.2, Site Screening, OU 7 Site screening will be completed at OU 7 prior to the initiation of confirmation sampling (Task 9). Groundwater at Site 16 will be screened using a drilling rig and the onsite analytical laboratory. The site screening methods and objectives are described in the TMSS.

Utility clearance will be obtained for Site 16 before intrusive activities begin. Groundwater will be screened vertically from the water table to approximately 110 feet bls. Samples collected will be submitted to the onsite laboratory for analysis of screening parameters. Screening will be completed at a minimum of 15 boring locations and a maximum of 50 boring locations. During the screening, detailed lithologic boring logs from each location will be completed and included in an electronic database for subsequent use and analysis during the remedial investigation report preparation.

Results of the groundwater analyses from the onsite laboratory will be evaluated in the field. Isoconcentration contour maps will be developed using the screening data. These will focus and guide the final selection of the soil and groundwater sampling locations during in the Confirmation Study. LOE for site screening has been developed assuming 2 days for completion of each unique boring location using a two-person field crew.

TASK 7, RI FIELD PROGRAM, CONFIRMATORY OU 1.

A confirmatory field program will be completed at OU 1 pursuant to Section 5 of SOW No. 77. This task includes all surface and subsurface soil sampling, soil boring, monitoring well installation, groundwater sampling, surface and sediment sampling, biological sampling, and other associated activities required to complete the RI/FS at OU 1. All activities will be executed as set forth in the TMSS.

The confirmatory field program for OU 1 has been divided into the following subtasks:

- Subtask 7.1, Soil Sampling;
- Subtask 7.2, Monitoring Well Installation;
- Subtask 7.3, Groundwater Sampling;
- Subtask 7.4, Surface Water and Sediment Sampling;
- Subtask 7.5, Biological Sampling;
- Subtask 7.6, Surface Soil Sampling; and
- Subtask 7.7 Analyses.

Subtask 7.1, Soil Sampling Four soil borings will be completed at OU 1 to support the characterizations of the nature and extent of contamination. Two samples will be collected from each boring for a total of eight soil samples. Quality Assurance/Quality Control (QA/QC) samples will also be collected. Additionally, two vadose zone samples (from above the water table), and six phreatic zone samples (in the water table) will be collected for geotechnical analysis. Vadose zone samples will be collected from preselected boreholes and phreatic zone samples will be collected from the screened interval of each monitoring well. Detailed lithologic logs of all soil borings will be completed and entered into an electronic database in preparation for inclusion of lithologic logs in the RI/FS report and for transmittal to the USGS. LOE for this subtask has been estimated assuming a three-person field crew (one of which is the FOL), 1 day of geotechnical sampling per 10-day event, and the completion of two soil borings per day including the input of boring log data and preparation of samples for shipment.

Subtask 7.2, Monitoring Well Installation A total of six monitoring wells will be installed at OU 1: two shallow monitoring wells, three double-cased intermediate monitoring wells, and one double-cased deep monitoring well. Detailed lithologic logs of all monitoring well borings will be completed and entered into an electronic database in preparation for inclusion of lithologic logs in the RI/FS report and transmittal to USGS. Each of the newly installed monitoring wells will be fully developed following installation.

Hydraulic conductivity testing will be completed on each of the newly installed monitoring wells. Slug tests will be performed, and the data will be collected using a transducer and a digital data logger. Slug test data will be downloaded into the appropriate software program for manipulation and development of documentation for incorporation in the RI/FS report.

LOE for this task has been estimated assuming a three-person field crew, and that two shallow monitoring wells can be installed in 1 day with mobilization, demobilization, and decontamination included. The installation of an intermediate or deep monitoring well will require 2 days with mobilization, demobilization, development, decontamination, 1 day to set surface casing, and one slug test per day (including data entry and interpretation).

Subtask 7.3, Groundwater Sampling Groundwater samples will be collected at each of the 6 newly installed monitoring wells and at 11 existing monitoring wells. QA/QC samples will also be collected. LOE for this subtask has been estimated assuming a three-person field crew and that two monitoring wells can be sampled per day (including mobilization, demobilization, decontamination, management of purge water, and preparation of the samples for shipment).

Subtask 7.4, Surface Water and Sediment Sampling Surface water and sediment sampling will be completed at OU 1. A total of 11 sets of surface water and sediment samples will be collected. QA/QC samples will also be collected. LOE for this task has been estimated assuming a three-person field crew and an average of 3 hours to collect a set of surface water and sediment samples (or four sets per day) and prepare them for shipment.

Subtask 7.5, Biological Sampling In accordance with Tasks 1 and 3 of the SOW, ABB-ES will complete biological sampling at OU 1 at NASCF that includes aquatic macroinvertebrate and fish sampling and toxicity testing. The biological sampling is discussed in the TMSS and Technical Memorandum for Ecological Risk Assessment (ABB-ES, 1992).

The information obtained from the biological sampling will be used in the assessment of potential ecological risks (Subtask 12.1) and evaluation of remedial alternatives (Subtask 16.1).

Aquatic Macroinvertebrate and Fish Sampling Aquatic macroinvertebrate and fish will be collected for chemical analyses as described in the TMSS at the same locations where surface water and sediment samples will be collected. Table 1 provides a summary of the aquatic macroinvertebrate and fish sampling that will be completed for OUs 1, 2, and 7. Additional sampling within the Rowell Creek and Sal Taylor Creek watersheds were added to identify releases from waste sites upstream of OUs 1, 2, and 7. This sampling was necessary for understanding potential releases of contamination and associated risks from OUs 1, 2, and 7.

<p style="text-align: center;">Table 1 Number of Locations for Aquatic Macroinvertebrate and Fish Sampling, OUs 1, 2, and 7</p>					
	Rowell Creek	Tributaries/ Ditches	Lake Fretwell	Sal Taylor Creek	Yellow Water Creek
OU 1					
Site 1	5			1	
Site 2		2			
Upstream	2	1			
OU 2					
Site 3					
Site 4					
Site 5		4	4		
Site 17					
Upstream	3	5			
OU 7 (Site 16)				6	
Other OUs		5		4	2
Reference	3		1	1	1
Totals	13	17	5	12	3
Notes:	OU = operable unit.				

Fourteen sampling locations are associated with OU 1. Five aquatic sampling locations are in Rowell Creek adjacent to and downstream of Sites 1 and 2. One sampling location is in Sal Taylor Creek downstream of Site 1. Three sampling locations are in Rowell Creek or tributaries upstream of Sites 1 and 2 and downstream of other waste sites. Three sampling locations will serve as reference and are upstream of all waste sites. Two locations are in the tributary adjacent to Site 2 (Table 1).

For each location, macroinvertebrates will be collected according to the FDER Standard Operating Procedures Manual for benthic macroinvertebrate sampling (FDER, 1992). Macroinvertebrate and fish sampling at each of the sampling locations will include the following tasks.

- General characterization of the aquatic habitat will include measuring dissolved oxygen, conductivity, pH, temperature, bottom substrate, percent cover, flow, and water color.
- Aquatic macroinvertebrates will be collected with a sediment core (an Ekman dredge will be used to collect samples from Lake Fretwell). Macroinvertebrates collected will be preserved and stored for identification.
- For sampling locations that can be reached by wading, macroinvertebrates will also be collected by use of a D-frame dip net according to sampling protocols developed by FDER. The intent is to sample different types of aquatic microhabitats including vegetation, sands, leaf packs, and snags. Macroinvertebrates collected will be preserved and stored for identification.
- Hester-Dendy artificial substrate samplers will be installed and collected after 30 days. These samplers will be used on a quarterly basis to monitor for seasonal variations. Macroinvertebrates will be collected from the samplers, preserved, and identified to the lowest practicable level (preferably species).
- Fish will be collected at the biological stations by use of net seines and minnow traps. Specimens collected will be identified and released.

The results of the macroinvertebrate sampling will be interpreted with the chemical contamination data and the sediment toxicity testing results to identify areas that may be impacted by contamination and/or other influences associated with the hazardous waste sites.

The aquatic sampling will be completed by a subcontractor. One ABB-ES Senior Ecologist will provide technical oversight and supervision for the subcontractor responsible for the aquatic sampling. The subcontractor will require 3 hours per location to complete the aquatic sampling for a total of 42 hours. ABB-ES field supervision will require 42 hours plus 8 hours for travel and 8 hours for preparatory time. ABB-ES technical oversight will require 1 hour per location for a total of 14 hours. Review and comment on the subcontractor aquatic sampling report will require 40 hours.

Toxicity Testing ABB-ES will complete toxicity testing of soils and sediments at OU 1. The toxicity testing proposed is in accordance with the Technical Memorandum for Ecological Assessment Methodology (ABB-ES, 1992). Toxicity testing includes collection of samples, laboratory testing, analyses of results, and letter report. Toxicity testing will be completed concurrently with the OU 1 RI. The results will be included in the risk assessment reports for OU 1 as scheduled in Appendix C.

Collection of Samples. Surface soils and sediments will be collected for toxicity testing. Table 2 summarizes the number of samples that will be collected at OUs 1, 2, and 7. The samples will be collected concurrently with surface soils and sediments being collected for chemical analyses (Subtasks 7.6 and 7.4, respectively). For OU 1, a total of 24 surface soil samples will be collected for toxicity testing. Fifteen samples will be collected at Site 1, eight at Site 2, and one at a reference location (Table 2).

Table 2
Sediment and Soil Toxicity Testing,
Operable Units 1, 2, and 7

Location	Soil Testing				Sediment Testing	
	14-day Earthworm ^{1,2}	Seed Germination Test ^{1,2}	Analyses of Plant Tissue ³	Chemical Analyses of Earthworms ⁴	14-day <i>Hyallolela</i> <i>azteca</i> ^{5,6}	7-day <i>Ceriodaphnia</i> <i>dubia</i> ^{5,6}
OU 1						
Site 1	15	15	1	1	5	5
Site 2	8	8	1	1	2	2
OU 2						
Site 3	3	3	1	1		
Site 4	8	8	1	1		
Site 5	6	6	1	1	8	8
Site 17	5	5	1	1		
OU 7 (Site 16)	0	0	0	0	3	3
Reference	3	3	1	1	1	1
Totals	48	48	7	7	19	19

¹Locations correspond with surface soil sampling locations (ABB-ES, 1992a).

²USEPA, 1989

³Plant tissue will be analyzed for target analyte list (TAL) analytes.

⁴Earthworms will be analyzed for TAL and target compound list (TCL) analytes.

⁵Locations correspond with sediment and surface water sampling locations (ABB-ES, 1992a).

⁶American Society for Testing and Materials, 1990

Note: OU = Operable Unit.



29 June 1993

Commanding Officer
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, SC 29418

Attention: Ms. Janet Morris

Subject: Errata I - Pages i and ii
Plan of Action (POA), dated June 1993
NAS Cecil Field, CTO #090

Dear Ms. Morris:

Please replace these two pages in Volume 1 of the POA. On Page i the dates in the third paragraph were changed to match the final schedule. On Page ii the second column was changed from "section" to "page".

Should you have any questions concerning this please call me.

Sincerely,

ABB ENVIRONMENTAL SERVICES, INC.


Barry Lester, P.E.
Task Order Manager

Enclosures

BL/kil

cc: Cliff Casey - SOUTH DIV
Ken Barnes - SOUTH DIV
Laurie Huffman - ABB-ES
Donna Scarborough - ABB-ES
Dirk Brunner - ABB-ES

29 June 1993
errata.poa

ABB Environmental Services, Inc.

2590 Executive Center Circle East
Berkeley Building
Tallahassee, FL 32301-5023

Telephone (904) 656-1293
Fax (904) 656-3386



24 June 1993

Commanding Officer
Southern Division
Naval Facilities Engineering
Janet Morris
2155 Eagle Drive
N. Charleston, SC 29419-9010

Subject: Final Plan of Action, CTO #090
NAS Cecil Field, Phase II, RI/FS
Operable Units 1, 2 and 7, Workplans and
Support for Investigative Set II
Contract No. 62647-89-D-0317

Dear Ms. Morris:

ABB Environmental Services, Inc. (ABB-ES) is pleased to forward the Final Plan of Action (POA) for CTO #090. This POA addresses the various work elements identified in the Statement of Work, No. 077, dated 28 January 1993. The POA is divided into twenty (20) individual tasks to support RI/FS Studies at three (3) operable units and one (1) PSC with a scheduled completion date of July 1995. This scope is complicated and includes primary deliverables, basewide studies, long range planning, USGS support, regulatory requirements and community relations to be addressed under the Federal Facilities Agreement. The POA is divided into two (2) volumes. Technical Proposal, Volume 1 of 2, RI/FS for OU's 1, 2 and 7, (Phase II), includes the detailed scope of services, schedule and summary cost models. Cost Proposal, Volume 2 of 2, includes additional backup supporting costs identified for the twenty (20) tasks.

ABB-ES was issued undefinitized funds in the amount of Five Hundred Thousand Dollars (\$500,000) on 08 April 1993 which enabled us to provide interim support during the negotiation process and to begin work that would enable us to meet the needs of the Navy. However, these funds have not allowed for the mobilization of major subcontractors or the execution of major field events, such as: drilling and analytical services. With the issuance of definitized funds under CTO #090, on 18 June 1993, in the amount of Three Million Three Hundred and Three Thousand Dollars (\$3,303,000) ABB-ES will be able to continue and complete work in accordance with the POA. It should be noted, however, that while the Statement of Work No. 77, identifies the scope of services, it additionally identifies and references a Site Management Plan (SMP), dated 20 October 1992. This SMP identifies certain due dates for deliverables associated with the three (3) operable units. The Draft Plan of Action which was predicated on a Notice to Proceed date and availability of funding, on 01 March 1993, would have allowed ABB-ES to meet deadlines in the 20 October 1992 SMP. Execution of work at this time will not be in agreement with the 20 October 1992 SMP and the schedule provided in Appendix "C" of Volume I is the scheduled dates for primary deliverables and other activities. This information was provided to you in an ABB-ES letter, dated 07 June 1993. ABB-ES is currently working with the Navy EIC to define SMP due dates and have in a recent meeting, of 17 June

24 June 1993
cto90poa.ltr

ABB Environmental Services, Inc.

2590 Executive Center Circle East
Berkeley Building
Tallahassee, FL 32301-5023

Telephone (904) 656-1293
Fax (904) 656-3386

1993, discussed dates with the USEPA and FDER which are identified in our schedule. We trust the Navy is in agreement with this for the execution of work under CTO #090.

ABB-ES is confident that the work elements and schedules identified in this Final Plan of Action will provide the necessary services to the Navy in execution of their Installation Restoration Program. We look forward to working with you and accomplishing this work.

Should you have any questions, please contact me at (904) 656-1293.

Sincerely,
ABB Environmental Services, Inc.



Barry Lester, P.E.
Task Order Manager

Enclosures

BL/kll

cc: Cliff Casey
Ken Barnes
Laurie Huffman
Donna Scarborough
Dirk Brunner

The LOE required for collection of the surface soil samples for toxicity testing will be in addition to that required for collection of the surface soil samples for chemical analysis in Subtask 7.6. Collection of samples for toxicity testing will require one Scientist, 2 hours per sample, for a total of 48 hours. A Senior Ecologist will be onsite for 2 days or 16 hours to ensure proper collection and shipment of the samples.

For OU 1 a total of eight sediment samples will be collected for toxicity testing. Five samples will be collected from Rowell Creek adjacent to Site 1, and two samples will be collected from the tributary adjacent to Site 2. The samples will be collected concurrently (split samples) with those for chemical analyses described in Subtask 7.4.

The LOE required for collection of the sediment samples for toxicity testing will be in addition to that required for collection of surface water and sediment samples described in Subtask 7.4. Collection of the sediment samples for toxicity testing will require a Senior Ecologist 4 hours per sample location for eight locations for a total of 32 hours.

The LOE assumes that an ABB-ES Senior Ecologist will oversee the soil sample collection and collection of sediment samples at different times. Eight hours of travel time are provided for two trips for a total of 16 hours.

Laboratory Testing. The eight sediment samples collected will be submitted for toxicity testing to a subcontract laboratory. Sediment toxicity testing will include the daphnid (*Ceriodaphnia dubia*) 7-day, three-brood survival and reproduction test, and the amphipod (*Hyallela azteca*) 28-day survival test (American Society for Testing and Materials [ASTM], 1990b).

The 24 surface soil samples collected will be submitted to a subcontract laboratory for testing with a 14-day earthworm (*Eisenia foetida*) survival test and a 7-day lettuce (*Lactuca sativa*) seed germination test (USEPA, 1989). Earthworms surviving the toxicity testing will be frozen and stored until the results of Subtask 7.6 are complete. Based on the results of the chemical analyses, a subset of the earthworms will be analyzed for Target Analyte List (TAL) and Target Compound List (TCL) analytes. It is assumed that two earthworm samples will be analyzed at OU 1 (Table 1).

Plant samples will also be collected for analyses of TAL inorganics. The location of plant samples will be determined based on the results of the analyses of surface soils. Plants growing in the soils with the highest overall concentration of contaminants will be analyzed. At OU 1, two plant samples will be collected and analyzed (Table 1). Collection of the plant samples will require 8 hours for an Associate Scientist.

Coordination and oversight of laboratory testing by an ABB-ES Senior Ecologist will require 0.5 hour per sample for 32 toxicity testing samples and four analytical samples for a total of 18 hours.

Analyses of Results. The results of the soil and sediment toxicity testing will be analyzed statistically to determine significant responses in comparison to reference samples and controls. The results will be summarized graphically and will be used to assess ecological risks (Ecological Assessment) and to develop remedial response objectives (Subtask 16.1) for each of the appropriate OUs.

The methods, results, statistical analyses, and conclusions of the toxicity testing will be included in the OU 1 Risk Assessment Report (Ecological Assessment). The results of the sediment testing will also be included in the Interim Facility Ecological Assessment Report (Task 19).

Subtask 7.6, Surface Soil Sampling A total of 23 surface soil samples will be collected from OU 1 during the current investigation. Fifteen of the soil samples will be collected from Site 1 and eight samples from Site 2. LOE for this task has been estimated assuming a three-person field crew and the collection of five surface soil samples per day (including mobilization, demobilization, decontamination, and sample preparation).

Subtask 7.7 Analyses All samples collected from OU 1 with the exception of the geotechnical samples from the soil borings, will be submitted for full TCL analysis (volatiles, semivolatiles, pesticides, and polychlorinated biphenyls [PCBs]) and TAL metals. Analysis of TCL and TAL parameters for surface water and sediment samples may require lower detection limits than TCL and TAL analysis for soil and groundwater. Sample-specific analytical requirements are presented in the TMSS at OUs 1, 2, and 7.

QA/QC samples will be collected throughout all soil and groundwater sampling at a rate of 1 QA/QC sample per 10 samples. Matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a rate of 1 MS/MSD sample per 20 samples. Other QA/QC samples including field blanks, equipment blanks, and travel blanks will be collected and submitted as required; the cumulative total of field, equipment, and travel blank QA/QC samples is estimated as approximately 30 percent of the total sample number. In addition to the TCL, TAL, and QA/QC samples discussed above, additional TCL and TAL samples have been included in the cost estimate. Additional characterization analysis has been added to the sampling program to provide for adequate characterization of unanticipated field conditions. These samples will be collected at the discretion of the FOL.

Toxicity Characteristic Leaching Procedure (TCLP) samples will also be collected during the field program. These samples will support an evaluation of offsite disposal options, to be completed during the FS, for materials encountered. A total of 10 TCLP samples are planned for the Confirmatory Field Program. TCLP samples will be collected at the discretion of the FOL and distributed among the three OUs. No LOE is presented for this subtask.

TASK 8, RI FIELD PROGRAM, CONFIRMATORY OU 2. A confirmatory field program will be completed at OU 2 pursuant to Section 5 of SOW No. 77. This task includes all surface and subsurface soil sampling, soil boring, monitoring well installation, groundwater sampling, surface and sediment sampling, biological sampling, and other associated activities required to complete the RI/FS at OU 2. All activities will be executed as set forth in the TMSS.

The confirmatory field program for OU 1 has been divided into the following subtasks:

- Subtask 8.1 Soil Sampling,
- Subtask 8.2 Monitoring Well Installation,
- Subtask 8.3 Groundwater Sampling,
- Subtask 8.4 Surface Water and Sediment Sampling,
- Subtask 8.5 Biological Sampling,
- Subtask 8.6 Surface Soil Sampling, and
- Subtask 8.7 Analyses.

LOE for all subtasks to be completed under Task 8 are estimated assuming a 12-hour workday.

Subtask 8.1, Soil Sampling Twenty soil borings will be completed at OU 2 to support the characterization of the nature and extent of contamination. Two samples will be collected from each boring for a total of 40 soil samples. Eight QA/QC samples will also be collected (four duplicates, two matrix spikes, and two matrix spike duplicates). Additionally, 8 vadose zone samples and 23 phreatic zone samples will be collected for geotechnical analysis. Vadose zone samples will be collected from preselected boreholes, and phreatic zone samples will be collected from the screened interval of each monitoring well. A total of 16 Shelby tube samples will be collected from OU 2; 6 for an analysis of vertical permeability at Sites 3, 5, and 17 and 10 for an evaluation of the bioremediation potential of the soils at Sites 5 and 17. Detailed lithologic logs of all soil borings will be completed and entered into an electronic database in preparation for inclusion of lithologic logs in the RI/FS report. LOE for this has been estimated assuming a three-person field crew, 1 day of geotechnical sampling per 10-day event, and completion of two soil borings per day, including the input of boring log data and preparation of samples for shipment.

Subtask 8.2, Monitoring Well Installation A total of 24 monitoring wells will be installed at OU 2: 17 shallow monitoring wells and 7 double-cased intermediate monitoring wells. Detailed lithologic logs of all monitoring well borings will be completed and entered into an electronic database in preparation for inclusion of lithologic logs in the RI/FS report. Each of the newly installed monitoring wells will be fully developed following installation.

Hydraulic conductivity testing will be completed on each of the newly installed monitoring wells. Slug tests will be performed and the data will be collected using a transducer and a digital data logger. Slug test data will be downloaded into the appropriate software program for manipulation and development of documentation for incorporation in the RI/FS report.

LOE for this task has been estimated assuming a three-person field crew, and that two shallow monitoring wells can be installed in 1 day (with mobilization, demobilization, 4 hours of well development, and decontamination included). The installation of an intermediate or deep well will require 2 days (with mobilization, demobilization, 4 hours of well development, decontamination, and 1 day to set surface casing included) and one slug test per day (including data entry and interpretation).

Subtask 8.3, Groundwater Sampling Groundwater samples will be collected at each of the 24 newly installed monitoring wells and at 20 existing monitoring wells. QA/QC samples will also be collected. In addition to the groundwater sampling outlined above, a total of nine soil borings for lithologic control to support DNAPL sampling will be completed at Sites 3, 5, and 17 (three borings each to 80, 60, and 40 feet bls, respectively). DNAPL sampling will be completed in adjacent boreholes immediately above units of low hydraulic conductivity as identified in the soil borings installed for lithologic control. Two DNAPL samples per boring location are estimated for a total of 18 samples. LOE for this subtask has been estimated assuming a three-person field crew, and that two monitoring wells can be sampled per day (including mobilization, demobilization, management of purge water, and preparation of the samples for shipment) and 2 days will be required to complete a DNAPL sampling boring set.

Subtask 8.4, Surface Water and Sediment Sampling Surface water and sediment sampling will be completed at OU 2, Site 5, only. A total of 16 sets of surface water and sediment samples will be collected. QA/QC samples will also be collected. LOE for this task has been estimated assuming a three-person field crew and an average of 3 hours to collect a set of surface water and sediment samples (or four sets per day) and prepare them for shipment.

Subtask 8.5, Biological Sampling In accordance with Tasks 1 and 3 of the SOW, ABB-ES will complete biological sampling at OU 2 at NASCF that includes aquatic macroinvertebrate and fish sampling and toxicity testing. The biological sampling is discussed in the TMSS and Technical Memorandum for Ecological Risk Assessment (ABB-ES, 1992).

The information obtained from the biological sampling will be used in the assessment of potential ecological risks (Ecological Assessment) and evaluation of remedial alternatives (Subtask 16.2).

Aquatic Macroinvertebrate and Fish Sampling Aquatic macroinvertebrate and fish will be collected at the same locations where surface water and sediment samples will be collected for chemical analyses (Subtask 8.4). Table 1 provides a summary of the aquatic macroinvertebrate and fish sampling that will be completed for OUs 1, 2, and 7. The aquatic sampling for OUs 1 and 2 will occur at the same time.

There are 17 aquatic sampling locations associated with OU 2. Four aquatic sampling locations are in the tributary adjacent to Site 5. Four sampling locations are in Lake Fretwell. Eight locations are in Rowell Creek and tributaries upstream of Sites 3, 4, 5, and 17 and downstream of other waste sites. One sampling location in Lake Newell will serve as a reference for Lake Fretwell. The same three reference locations in Rowell Creek sampled in Subtask 7.5 will serve as a reference for the Rowell Creek samples (Table 1).

For each location, macroinvertebrates will be collected according to the FDER Standard Operating Procedures Manual for benthic macroinvertebrate sampling (FDER, 1992). Macroinvertebrate and fish sampling at each of the sampling locations will include the tasks described in subtask 7.5.

The results of the macroinvertebrate sampling will be interpreted with the chemical contamination data (Subtask 8.4) and sediment toxicity testing results to identify areas that may be impacted by contamination and/or other influences associated with the hazardous waste sites.

The aquatic sampling will be completed by a subcontractor. One ABB-ES Senior Ecologist will provide technical oversight and supervision for the subcontractor responsible for the aquatic sampling. The subcontractor will require 3 hours to complete the aquatic sampling for each of the 17 locations for a total of 51 hours. ABB-ES field supervision will require the same 51 hours. The LOE for the ABB-ES Senior Ecologist assumes 8 hours of travel time. ABB-ES technical oversight of the subcontractor prior to and after the sampling will require 1 hour per location for a total of 16 hours.

Toxicity Testing ABB-ES will complete toxicity testing of soils and sediments at OU 1. The toxicity testing proposed is in accordance with the Technical Memorandum for Ecological Assessment Methodology (ABB-ES, 1992). Toxicity testing includes collection of samples, laboratory testing, analyses of results, and a letter report.

Toxicity testing will be completed concurrently with the OU 2 RI. The results will be included in the risk assessment reports for OU 2 as scheduled in Appendix C.

Collection of Samples. Surface soils and sediments will be collected for toxicity testing. Table 1 summarizes the number of samples that will be collected at OUs 1, 2, and 7. The samples will be collected concurrently with surface soils and sediments being collected for chemical analyses (Subtasks 8.6 and 8.4, respectively).

For OU 2, a total of 32 surface soil samples will be collected for toxicity testing. Three samples will be collected at Site 3, 8 samples from Site 4, 11 samples from Site 5, 9 samples from Site 17, and 1 from a reference location (Table 1).

The LOE required for collection of the surface soil samples for toxicity testing will be in addition to that required for collection of the surface soil samples in Subtask 8.6. Collection of the 32 soil samples for toxicity testing will require one Scientist, 2 hours per sample, for a total of 64 hours. A Senior Ecologist will be onsite for 2 days or 16 hours to ensure proper collection and shipment of the samples.

For OU 2 a total of eight sediment samples will be collected for toxicity testing. Four samples will be collected from the tributary adjacent to Site 5 and four in Lake Fretwell downstream of the Site 5 tributary. The samples will be collected concurrently (split samples) with those for chemical analyses as described in Subtask 8.4.

The LOE required for collection of the sediment samples for toxicity testing will be in addition to that required for collection of surface water and sediment samples described in Subtask 8.4. Collection of the sediment samples for toxicity testing will require a Senior Ecologist 4 hours per sample location at eight locations for a total of 32 hours.

The LOE assumes that an ABB-ES Senior Ecologist will oversee the soil sample collection at a time different from that described in Subtask 7.5. Eight hours of travel time are provided for one trip.

Laboratory Testing. The eight sediment samples collected will be submitted for toxicity testing to a subcontract laboratory. Sediment toxicity testing will include the daphnid (*Ceriodaphnia dubia*) 7-day, three-brood survival and reproduction test, and the amphipod (*Hyalloa azteca*) 28-day survival test (ASTM, 1990b).

The 32 surface soil samples collected will be submitted to a subcontract laboratory for testing with a 14-day earthworm (*Eisenia foetida*) survival test (USEPA, 1989). The 20 samples to be collected from Sites 5 and 17 will also be submitted for a 7-day lettuce (*Lactuca sativa*) seed germination test (USEPA, 1989). Earthworms surviving the toxicity testing will be frozen and stored until the results of Subtask 8.6 are complete. Based on the results of the chemical analyses, a subset of the earthworms will be analyzed for TAL and TCL analytes. It is assumed that four earthworm samples will be analyzed for OU 2 (Table 1).

Plant samples will also be collected for analyses of TAL inorganics. The location of plant samples will be determined based on the results of the analyses of surface soils. Plants growing in the soils with the highest overall concentration of contaminants will be analyzed. For OU 2 it is assumed that one plant sample will be collected from each of the four Sites for a total of four samples (Table 1). Collection of the plant samples will require a Scientist 16 hours.

Coordination and oversight of laboratory testing by an ABB-ES Senior Ecologist will require 0.5 hour per sample for 31 toxicity testing samples and eight analytical samples for a total of 26 hours.

Analyses of Results. The results of the soil and sediment toxicity testing will be analyzed statistically to determine significant responses in comparison to reference samples and controls. The results will be summarized graphically and will be used to assess ecological risks in subtask 12.2.2 and to develop remedial response objectives in Subtask 16.2.

The methods, results, statistical analyses, and conclusions of the toxicity testing will be included in the OU 2 Risk Assessment Report (Subtask 12.2). The results of the sediment testing will also be included in the Interim Facility Ecological Assessment Report (Task 19).

Subtask 8.6, Surface Soil Sampling A total of 47 surface soil samples will be collected from OU 1 during the current investigation. Eleven of the soil samples will be collected from Site 3, 16 from Site 4, 11 from Site 5, and 9 samples from Site 17. LOE for this task has been estimated assuming a three-person field crew and the collection of five surface soil samples per day (including mobilization, demobilization, decontamination, and sample preparation).

Subtask 8.7, Analyses Analyses to be completed for the confirmatory sampling at OU 2 and QA/QC sampling requirements are the same as those detailed in Section 7.7 for OU 1. No LOE has been developed for this task.

TASK 9, RI FIELD PROGRAM, CONFIRMATORY OU 7. A confirmatory field program will be completed at OU 7 pursuant to Section 5.1 of SOW No. 77. This task includes all surface and subsurface soil sampling, soil boring, monitoring well installation, groundwater sampling, surface and sediment sampling, biological sampling, and other associated activities required to complete the RI/FS at OU 7. All activities will be executed as set forth in the TMSS.

The confirmatory field program for OU 7 has been divided into the following subtasks:

- Subtask 9.1, Soil Sampling;
- Subtask 9.2, Monitoring Well Installation;
- Subtask 9.3, Groundwater Sampling;
- Subtask 9.4, Surface Water and Sediment Sampling;
- Subtask 9.5, Biological Sampling;
- Subtask 9.6, Surface Soil Sampling;
- Subtask 9.7, Analyses; and
- Subtask 9.8, Aquifer Performance Testing.

LOE for all subtasks to be completed under Task 9 are estimated assuming a 12-hour workday. LOE and costs estimated for the field program at OU 7 have been developed assuming all work will be conducted under Level B personal protection.

Subtask 9.1, Soil Sampling Eight soil borings will be completed at OU 7 to support the characterization of the nature and extent of contamination. Two samples will be collected from each boring for a total of 16 soil samples. QA/QC samples will also be collected. Additionally, 2 vadose zone samples and 10 phreatic zone samples will be collected for geotechnical analysis. Vadose zone samples will be collected from preselected boreholes and phreatic zone samples will be collected from the screened interval of each monitoring well. A total of two Shelby tube samples will be collected from OU 7 for an analysis of vertical permeability. Detailed lithologic logs of all soil borings will be completed and entered into an electronic database in preparation for inclusion of lithologic logs in the RI/FS report. LOE for this has been estimated assuming a three-person field crew, 1 day of geotechnical sampling per 10-day event, and the completion of two soil borings per day including the input of boring log data and preparation of samples for shipment.

Subtask 9.2, Monitoring Well Installation A total of 10 monitoring wells will be installed at OU 7: 4 shallow monitoring wells, 4 intermediate monitoring wells, and 2 double-cased deep monitoring wells. Detailed lithologic logs of all monitoring well borings will be completed and entered into an electronic database in preparation for inclusion of lithologic logs in the RI/FS report. Each of the newly installed monitoring wells will be fully developed following installation.

Hydraulic conductivity testing will be completed on each of the newly installed monitoring wells. Slug tests will be performed and the data will be collected using a transducer and a digital data logger. Slug test data will be downloaded into the appropriate software program for manipulation and development of documentation for incorporation in the RI/FS report.

LOE for this task has been estimated assuming a three-person field crew, and that two shallow monitoring wells can be installed in 1 day (with mobilization, demobilization, 4 hours of well development, and decontamination included). The installation of an intermediate or deep monitoring well will require 2 days (with mobilization, demobilization, 4 hours of well development, decontamination, and 1 day to set surface casing included) and one slug test per day (including data entry and interpretation).

Subtask 9.3, Groundwater Sampling Groundwater samples will be collected at each of the 10 newly installed monitoring wells and at 7 existing monitoring wells. QA/QC samples will also be collected. In addition to the groundwater sampling outlined above, a total of three soil borings for lithologic control to support DNAPL sampling will be completed at OU 7. The borings will be completed to a maximum depth of 120 feet bls. DNAPL sampling will be completed in adjacent boreholes immediately above units of low hydraulic conductivity as identified in the soil borings installed. Three DNAPL samples per boring location are estimated for a total of nine samples. LOE for this subtask has been estimated assuming a three-person field crew, and that two monitoring wells can be sampled per day (including mobilization, demobilization, decontamination, management of purge water, and preparation of the samples for shipment) and 2 days will be required to complete a DNAPL sampling boring set.

Subtask 9.4, Surface Water and Sediment Sampling Surface water and sediment sampling will be completed at OU 7. A total of 24 sets of surface water and sediment samples will be collected. QA/QC samples will also be collected. LOE for this task has been estimated assuming a three-person field crew and an average of 34 hours to collect a set of surface water and sediment samples (or three sets per day) and prepare them for shipment.

Subtask 9.5, Biological Sampling In accordance with Tasks 1 and 3 of the SOW, ABB-ES will complete biological sampling at OU 7 at NASCF that includes aquatic macroinvertebrate and fish sampling and sediment toxicity testing. The biological sampling is discussed in the TMSS and Technical Memorandum for Ecological Risk Assessment (ABB-ES, 1992).

The information obtained from the biological sampling will be used in the assessment of potential ecological risks and evaluation of remedial alternatives (Subtask 16.3).

Aquatic Macroinvertebrate and Fish Sampling Aquatic macroinvertebrate and fish will be collected at the same locations where surface water and sediment samples will be collected for chemical analyses as described in the SAP. Table 1 provides a summary of the aquatic macroinvertebrate and fish sampling that will be completed for OUs 1, 2, and 7. The aquatic sampling for OU 7 will occur at the same time as Subtasks 7.5 and 8.5.

There are six aquatic sampling locations in Sal Taylor Creek associated with OU 7 (Table 1). There are 12 locations associated with other OUs in the Sal Taylor and Yellow Water Creek drainage basins. One reference location is included for Yellow Water Creek. These locations will be sampled to provide biological data that is comparable with the OU 1, 2, and 7 locations.

For each location, macroinvertebrates will be collected according to the FDER Standard Operating Procedures Manual for benthic macroinvertebrate sampling (FDER, 1992). Macroinvertebrate and fish sampling at each of the sampling locations will include the tasks described in Subtask 7.5.

The results of the macroinvertebrate sampling will be interpreted with the chemical contamination data (Subtask 9.4) and sediment toxicity testing results to identify areas that may be impacted by contamination and/or other influences associated with Site 16.

The aquatic sampling will be completed by a subcontractor. One ABB-ES Senior Ecologist will provide technical oversight and supervision for the subcontractor responsible for the aquatic sampling. It is assumed that supervision will not be necessary to the extent allowed for Subtasks 7.5 and 8.5. ABB-ES field supervision will require 1 hour per location for a total of 19 hours plus 8 hours travel time.

Toxicity Testing ABB-ES will complete toxicity testing of sediments at OU 7. The toxicity testing proposed is in accordance with the Technical Memorandum for Ecological Assessment Methodology (ABB-ES, 1992). Toxicity testing includes collection of samples, laboratory testing, analyses of results, and a letter report.

Toxicity testing will be completed concurrently with the OU 7 RI. The results will be included in the risk assessment reports for OU 7 as scheduled in Appendix C.

Collection of Samples. For OU 7 a total of three sediment samples from Sal Taylor Creek will be collected for toxicity testing. The samples will be collected concurrently (split samples) with those for chemical analyses, Subtask 9.4.

The LOE required for collection of the sediment samples for toxicity testing will be in addition to that required for collection of surface water and sediment samples in Subtask 9.4. Collection of the sediment samples for toxicity testing will require a Senior Ecologist 4 hours per sample location at three locations for a total of 12 hours.

Laboratory Testing. The three sediment samples collected will be submitted for toxicity testing to a subcontract laboratory. Sediment toxicity testing will include the daphnid (*Ceriodaphnia dubia*) 7-day, three-brood survival and reproduction test, and the amphipod (*Hyallela azteca*) 28-day survival test (ASTM, 1990b).

Coordination and oversight of laboratory testing by an ABB-ES Senior Ecologist will require approximately 0.5 hour per sample for three toxicity testing samples for a total of 2 hours.

Analyses of Results. The results of the soil and sediment toxicity testing will be analyzed statistically to determine significant responses in comparison to reference samples and controls. The results will be summarized graphically and will be used to assess ecological risks in Subtask 12.3 and to develop remedial response objectives in Subtask 16.3.

The methods, results, statistical analyses, and conclusions of the toxicity testing will be included in the OU 7 Risk Assessment Report (Subtask 12.3). The results of the sediment testing will also be included in the Interim Facility Ecological Assessment Report (Task 19).

Subtask 9.6, Surface Soil Sampling A total of four surface soil samples will be collected from OU 7 during the current investigation. LOE for this task has been estimated assuming a three-person field crew and the collection of four surface soil samples per day (including mobilization, demobilization, decontamination, and sample preparation).

Subtask 9.7, Analyses Analyses to be completed for the confirmatory sampling at OU 2 and QA/QC sampling requirements are the same as those detailed in Subtask 7.7 for OU 1. No LOE has been developed for this task.

Subtask 9.8, Aquifer Performance Testing Information from previous studies indicates that significant groundwater contamination exists at OU 7. It is, therefore, likely that some form of groundwater extraction and treatment will be necessary during the remediation of the site. Aquifer performance testing (APT) will be completed during the investigation of OU 7 to gather the information necessary to design the groundwater extraction portion of the future remedial system. This section briefly discusses the major elements to be included in the APT. These elements are the (1) evaluation of existing data, (2) APT preparation, (3) APT completion, and (4) evaluation of the data generated.

An evaluation of the existing data for OU 7 will be conducted prior to completing the APT. This evaluation of existing data will guide the selection of several of the APT design parameters. Data to be considered in the evaluation include water level information from the OU 7 wells, the boring logs, monitoring well construction diagrams, and the results of groundwater screening to be completed at OU 7 (see Task 6).

The evaluation of existing data and screening data will be used to assist in the design of the APT. APT parameters that will be selected based on the results of this review include:

- locations for recovery well(s),
- well depths and hydrogeologic intervals tested,
- well diameters(s),
- screen lengths, and
- well screen slot sizes.

Site screening data and existing data will also be used in identifying a method of disposal for development and APT waters.

Preparation for the APT will follow the data evaluation and the selection of a disposal method for waters generated. First the production wells will be installed and developed. Production wells will be at least 6 inches in diameter with continuous wrapped screens. Additionally, the production wells will be located so that existing monitoring wells at the site can be used as observation wells during the performance testing, if possible.

Several field observations are planned while the production wells are being developed as part of the APT preparation. Water levels in the production wells will be monitored during well development to determine preliminary specific capacity for the production wells. The development of the cone of depression will also be observed using existing observation wells. Following the development of the

production wells, the Theis model will be used to determine the most effective observation well spacing for the APT.

Observation wells will be installed and developed after the spacing has been determined. Existing wells will be used as observation wells whenever possible. After the proper data logging equipment has been assembled and the aquifer has had time to recover from the development of the observation wells, a step drawdown test will be completed on each of the two production wells. The test will determine the actual specific capacity of the production wells, so that the correct pumping rate can be used during the APT.

The aquifer performance testing will include a 24-hour static period during which water levels in the production and observation wells will be monitored to determine static fluctuations in the water table; a 72-hour pumping interval and a 48-hour recovery interval. Water levels will be monitored during each interval using electronic data loggers in addition to manual monitoring of water levels.

Upon completion of aquifer performance testing, data will be compiled and analyzed according to the appropriate hydrogeologic method as indicated from preliminary analysis of drawdown and recovery data. Evaluation of the data generated from the test will be completed as part of the RI for OU 7 (Subtask 13.3). No separate deliverable will be submitted.

TASK 10, RI FIELD PROGRAM, FACILITY-WIDE SAMPLING AND ECOLOGICAL MAPPING. Sampling and ecological mapping at selected locations within the NAS will be completed during the present investigation pursuant to Sections 5.1 and 5.3 of SOW No. 77. Background sampling will consist of the collection of surface soil samples, subsurface soil samples, and groundwater samples. Ecological studies to be completed include a wetlands assessment, wetlands mapping, and habitat mapping. This task has been divided into the following subtasks:

- Subtask 10.1, Soil Sampling;
- Subtask 10.2, Monitoring Well Installation;
- Subtask 10.3, Groundwater Sampling;
- Subtask 10.4, Wetlands Assessment and Mapping;
- Subtask 10.5, Habitat Mapping;
- Subtask 10.6, Water Level Measurement;
- Subtask 10.7, Installation Restoration Well Location Map;
- Subtask 10.8, Location Survey; and
- Subtask 10.9, Facility-Wide IR Program Monitoring Well Maintenance.

The development of a database for background soil and groundwater concentrations is essential to the completion of the RI and the FS. Several of the analytes considered during the contaminant evaluation for the RI/FS are naturally occurring inorganic parameters. These analytes exist in nature at varying concentrations, because of the nature of the source materials from which the deposits are made (for soils) and the interaction between groundwater and the aquifer materials. Site contaminants are compared with naturally occurring background ranges for inorganic parameters during the identification of contaminants of concern for both soil and groundwater. Therefore, an accurate and representative background database for naturally occurring inorganic parameters is an essential part of the RI/FS process. Additionally, the database developed during the background sampling will be applicable to other, future remedial response actions at NASCF.

Sampling of media to determine background parameters at NASCF will be conducted at three separate locations in the vicinity of OUs 1, 2, and 7. The samples described below will be collected.

Subtask 10.1, Soil Sampling Both surface and subsurface soil samples will be collected for the characterization of naturally occurring background conditions at NASCF. The selection of the exact soil sampling locations will follow a detailed review of historical aerial photographs for the facility. A total of 45 soil samples (including both surface and subsurface soils) are to be collected and analyzed for full TCL and TAL metals. A maximum of 15 soil borings are planned during the collection of the soil samples. QA/QC samples will also be collected.

In addition to the samples collected for chemical characterization, a maximum of 15 samples will be submitted for geotechnical analysis, 6 samples from the vadose zone and 9 from the phreatic zone. Detailed lithologic logs of all soil borings will be completed and entered into an electronic database in preparation for inclusion of lithologic logs in the RI/FS report. The LOE for this task has been estimated assuming a three-person field crew, one day of geotechnical sampling per 10-day event, the completion of two soil borings per day including the input of boring log data, and the preparation of samples for shipment.

Subtask 10.2, Monitoring Well Installation A total of nine monitoring wells will be installed during the background sampling: six shallow monitoring wells and three intermediate wells. Each of the newly installed monitoring wells will be fully developed following installation.

Hydraulic conductivity testing will be completed on each of the newly installed monitoring wells. Slug tests will be performed and the data will be collected using a transducer and a digital data logger. Slug test data will be downloaded into the appropriate software program for manipulation and development of documentation for incorporation in the RI/FS report. LOE for this task has been estimated assuming a three-person field crew, that two shallow monitoring wells can be installed in 1 day (with mobilization/demobilization, 4 hours of well development, and decontamination included), the installation of an intermediate well will require 2 days (with mobilization, demobilization, 4 hours of well development, decontamination, and 1 day to set the surface casing included), and one slug test per day (including data entry and interpretation).

Subtask 10.3, Groundwater Sampling Groundwater samples will be collected at each of the nine newly installed monitoring wells. QA/QC samples will also be collected. Groundwater samples will be submitted for full TCL and TAL metals analyses. LOE for this subtask has been estimated assuming a three-person field crew and that two monitoring wells can be sampled per day (including mobilization, demobilization, management of purge water, and the preparation of samples for shipment).

Subtask 10.4, Wetlands Assessment and Mapping In accordance with Subsection 6.1 of the SOW, ABB-ES will complete a wetlands assessment. The wetlands assessment includes: identification of wetlands, characterization of wetlands, functional assessment, delineation, and letter reports.

Identification of Wetlands Wetlands will be identified according to current Federal and State guidelines based on a field survey, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, existing wetlands maps, aerial photographs, and USGS topographic maps.

Characterization of Wetlands Wetlands identified in subtask 10.4 will be characterized according to the system provided by the Florida Natural Areas Inventory (FNAI) and U.S. Army Corps of Engineers (USACE). A map will be created that shows the general location of wetlands in relation to the hazardous waste sites.

The wetland characterization will be performed at the same time as the wetlands identification. The characterization will require 7.5 days in the field at 8 hours a day for two Senior Ecologists. Three days will be required for production of the map by the computer assisted drafting (CAD) draftsman. Travel for the Senior Scientists to the site is 4 hours each way per person for one trip for a total of 16 hours.

Functional Assessment A functional assessment will be completed for wetlands identified at OUs 1, 2, and 7. The following functions of the wetlands will be evaluated: floodflow alteration, sediment stabilization, sediment and toxicant retention, nutrient removal and transformation, groundwater recharge and discharge, wildlife diversity and abundance, aquatic diversity and abundance, uniqueness, contaminant mobility and transfer, prospects for restoration, and recreation.

The results of the functional assessment will be used in the FS to evaluate the effects of remedial alternatives on wetland function and to serve as a basis of comparison between the created or restored wetland and the current (unremediated) wetland.

Delineation Wetlands identified on PSCs 1, 2, 3, 4, 5, 6, 10, 11, and 17 will be delineated in accordance with appropriate State and Federal regulations.

The LOE for wetlands delineation assumes that six wetlands will be delineated. The delineation for each wetland will require 9 hours each for two Senior Ecologists in the field.

Letter Reports The methods and results of the wetlands assessment will be recorded in a separate letter report for each PSC. The following copies of each letter report will be delivered:

SOUTHNAVFACENGCOM	3
NASCF (Code 20IR)	4
NASCF Forester	2
Region IV USEPA	2
FDER	2
NRT (each)	1

The LOE for each letter reports assumes 24 hours for a Senior Ecologist to complete a report and 4 hours for a Senior Ecologist to review a report.

Subtask 10.5, Habitat Mapping ABB-ES will complete identification and general mapping of terrestrial wildlife habitats as directed in Subsection 6.1 of the SOW. Plant communities at NASCF will be identified and classified according to the system specified by the FNAI (1990). Communities will be characterized based on vegetation structure and composition, topography, land form, substrate, soil moisture condition, climate, and fire.

Observations made and information gathered during a field survey will be recorded on topographic maps available for the NASCF facility. The terrestrial communities identified on the maps will be recorded digitally. The habitat mapping will be completed concurrently with the OU 1 RI report as scheduled in the 1993 SMP. The results of the mapping will be used in the Risk Assessment Reports for OU 1, OU

2, and OU 7. The methods and results of the habitat mapping will be recorded in a letter report. The following copies of the letter report will be delivered:

SOUTHNAVFACENGCOM	3
NASCF (Code 20IR)	4
NASCF Forester	2
Region IV USEPA	2
FDER	2
NRT (each)	1

The field survey of OUs 1, 2, and 7 will require 4 days for two Senior Ecologists for a total of 64 hours plus 16 hours of travel time. Recording the results of the field survey into a digital map will require 40 hours. The letter report will require 1 week for a Senior Ecologist and Scientist to draft, 8 hours for a Senior Ecologist for review, and 4 hours for a Technical Expert to review and comment.

Subtask 10.6, Water Level Measurement In accordance with Section 6, Miscellaneous Field Work, Subsection 6.3 of the SOW, ABB-ES will provide the following support services. ABB-ES will collect and record, on a bimonthly basis, water level measurements in all RI wells (approximately 70 wells). The water levels will be measured to develop a potentiometric (water table contour) map and to determine the direction of groundwater flow. These measurements will be collected within a 2-day period, every other month.

The water level collection requires the measuring of the water level elevation to the nearest 0.05 foot above mean sea level, sounding of each well, and decontaminating the measuring equipment. The data are compiled into tables, entered into a permanent archival database, and plotted to provide an interpreted potentiometric contour map. After each round of water level measurements are collected, ABB-ES will compile the raw data into a letter report containing the potentiometric contour map, a summary table with the well identifier, and water elevation reported as feet above mean sea level and barometric pressure. The potentiometric contour map for each PSC or OU will also be used in the respective RI report.

Measurement of the water level in each well and decontamination of equipment will require 0.5 hour per well. Each sampling event will require 2 hours of a Senior Scientist's time to coordinate. Data entry into the database will require a total of 4 hours per sampling event. Production of isocontour maps for each of the six sites will require 3 hours of a Senior CAD operator's time. In addition, a Senior Scientist will need 1.5 hours to oversee the data entry and CAD operation and to produce a letter summary report.

Subtask 10.7, Installation Restoration Well Location Map A topographic map of NASCF will be generated in AutoCAD™, Release 11, format. The map will show the location of all IR program monitoring wells (currently, 69 total). To obtain a map in which individual wells can be delineated, the portion of the base map south of Normandy Boulevard will be electronically enlarged and scaled to provide adequate resolution.

The deliverable will be 10 copies of one D-size blue-line print. Along with each map, a well construction table will be provided indicating at a minimum the following information: well number, date installed, X and Y State plane coordinates, top of casing elevation, length of casing above land surface, land surface elevation, length of screen, total depth of well, bottom of screen elevation, length of surface casing, bottom of hole elevation, screen slot size, and construction materials.

Subtask 10.8, Location Survey As part of the investigative IR program site support, a location survey will be required. Survey activities under this task will be performed concurrently to accomplish the following objectives: (1) locate all new monitoring wells and sample points, (2) locate all existing monitoring wells to complete the IR program well location map, (3) establish horizontal and vertical control throughout the facility, and (4) locate Investigative Set I site boundaries as they are delineated.

Horizontal control will be established by performing a Global Positioning Survey (GPS) that will be tied into the Florida High Precision Network. Horizontal points will be based on the North American Datum of 1983 (NAD83-90). Vertical control will be established from existing offsite National Geodetic Survey (NGS) benchmarks. To establish control throughout the facility, control monuments will be set at or near the following IR sites:

- Site 1, Old Landfill;
- Site 2, Recent Landfill;
- Site 3, Oil Sludge Disposal Area;
- Site 4, Grease Pits;
- Site 5, Oil Disposal Area Northwest;
- Site 6, Lake Fretwell Rubble Disposal Area;
- Site 7, Old Fire Fighting Training Area;
- Site 8, Boresite Range Fire Fighting Training Area;
- Site 9, Recent Grease Pits;
- Site 10, Rubble Disposal Area;
- Site 11, Golf Course Pesticide Disposal Area;
- Site 12, Public Works Rubble Disposal Area;
- Site 14, Blue 5 Ordnance Disposal Area;
- Site 15, Blue 10 Ordnance Disposal Area;
- Site 16, Aircraft Intermediate Maintenance Department (AIMD) Seepage Pit;
- Site 17, Oil Sludge Disposal Pit Southwest;
- Site 18, Ammunition Spill Area; and
- Site 19, Rowell Creek Rubble Disposal Area.

Although not all of the above sites are currently under investigation, establishing control at all the sites now will make future surveying efforts less costly. The surveying will be subcontracted to an Occupational Safety and Health Administration (OSHA) trained Professional Land Surveyor registered in the State of Florida. Completion of all surveying will require three separate events in 1993. All work will be supervised by ABB-ES personnel.

A Senior Engineer will make one, 1-day site visit per survey event to ensure that the survey work is being performed to specifications. A Senior Engineer will require 16 hours to review deliverables from each event. A CAD operator will require 36 hours to update existing site maps with new survey data.

Subtask 10.9, Facility-Wide Installation Restoration (IR) Program Monitoring Well Maintenance This task includes the evaluation, redevelopment, reconditioning, and abandonment of existing IR program monitoring wells. Copies of all permits for well abandonment and a report that summarizes the condition of existing wells shall be provided to the Navy.

This task will be completed in two phases. The initial phase develops a letter report to the NRPM recommending specific well maintenance and abandonment activities based on records review and field observation. Upon authorization to proceed by the NRPM, the recommended activities will be implemented and a summary report will be prepared in the second phase.

Evaluation ABB-ES will develop an inventory of IR program monitoring wells and will review existing well lithologic logs to evaluate if the wells were properly constructed and are screened within a single hydrological unit. All wells that do not meet these two criteria will be recommended for abandonment. Operational records for the wells will be reviewed to evaluate their performances and need for redevelopment or other maintenance actions.

ABB-ES will also observe the integrity of well security and protective casings, review records for accuracy and completeness, and will measure the depth to the bottom of all wells to assess the current condition of each well. Recommendations will be to redevelop wells found to have excessive sediment accumulation at the bottom. Additional maintenance and reconditioning procedures may be used to correct other identified problems.

ABB-ES will provide an IR program well summary report. The summary will describe the recommended action to recondition or redevelop wells and identified those wells that should be abandoned. The report will recommend the method for proper abandonment.

Implementation Upon authorization to proceed with the recommendations made, IR program monitoring well maintenance and abandonment actions will be undertaken. It is estimated that 20 monitoring wells will need to be abandoned because they have been screened across more than one hydrogeologic unit or are not considered useful for continued monitoring activities. It is also assumed that 10 monitoring wells will need to be redeveloped. An additional 20 wells are assumed to require maintenance consisting of repair of protective casings and label replacement. A more accurate description of actions to be undertaken in this subtask will be available when the evaluation is completed, but the above assumptions are considered reasonable based on field activities already conducted by ABB-ES at NASCF.

At the completion of well maintenance and abandonment actions, a summary report will be prepared and submitted to the NRPM. The report will summarize conditions at existing IR program monitoring wells, identify criteria and data used to develop recommendations, document actions taken at each inventoried well, and include copies of permits for all abandoned wells. The report will be submitted to the NRPM in accordance with the schedule in Appendix C.

The LOE for this subtask is based on the assumption that each well to be abandoned will require overteaming and removal of well materials and will be grouted the full length estimated at 40 feet. All materials removed from abandoned wells are assumed to be managed as hazardous waste. Maintenance activities are assumed to require replacement of labels, lockable protective casing lids, and riser caps.

TASK 11, DATA VALIDATION AND MANAGEMENT. Data validation and management will be completed pursuant to Sections 5.2 and 11.1 of the Statement of Work No. 77. This task will consist of three subtasks:

- 11.1, Data Validation;
- 11.2, Data Management; and
- 11.3, USEPA and FDER Data Reporting.

Subtask 11.1, Data Validation Laboratory analysis and data validation of sediment, surface water, surface and subsurface soil, and groundwater samples will be performed in accordance with Naval Energy and Environmental Support Activity (NEESA) Level D and C data validation protocol as described in *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program* (NEESA 20.2-047B, June 1988). Laboratory analyses and data validation will be subcontracted.

The validated data received from the subcontractors will be reviewed by a QA Manager for consistency and completeness. The LOE for this subtask is based on the QA Manager reviewing 5 percent of validated data for 3 hours per sample as a quality control check of the validation activities. A total of approximately 511 samples (including QA/QC) are scheduled for collection during the confirmatory sampling programs outlined in the TMSS.

The data obtained from the data validation subcontractor will be entered into the Automated Compliance System (ACS) database. ACS will provide all data in an appropriate format for inclusion in the Baseline Risk Assessment (BRA), RI, and FS reports as well as permanently archiving the analytical data. The data will be reviewed for typographic errors and nomenclature before being included into the ACS database. The LOE for this data entry is estimated using 1.3 hours per station for entering a full TCL sample (volatile organic analytes [VOAs], semivolatile organic analytes [SVOAs], TAL metals, pesticides, and PCBs) and other station-specific parameters.

Following validation, the data will be evaluated relative to the data quality objectives set forth in the RI/FS Workplan and the TMSS. The LOE for the data evaluation is based on Senior Chemist review of the data from each sample for 15 minutes and a Hydrogeologist reviewing each sample for 5 minutes (all fractions included). This review will assist the project team by evaluating the analytical quantity determined for each analyses relative to the location from which the sample was collected and the known fate and transport characteristics of individual analytes detected.

Subtask 11.2, Data Management This task will include the management of both laboratory analytical and field data developed during initial field programs completed for each of the OUs (1992 field program) and the supplemental sampling to be completed during the current investigation. Data management will provide for the manipulation, summarization, tabulation, and presentation of the data gathered.

The validated laboratory analytical data for all analyses will be presented in tables incorporating the data qualifiers, which identify usability appropriate for each measurement. Tables showing all analytical results will be included as appendices to the RI report for each operable unit. In addition to tables for all analyses, summary tables will be compiled for the presentation of analytes detected in the various media. These "hits only" tables will be used in the text of the RI, BRA, and FS reports. Synthesis of the laboratory analytical data from the 1992 field program and from the current investigation will be required. LOE for this portion of the data management subtask are estimated assuming 652 discrete samples will be considered (511 from the current investigation and 141 from the previously conducted Phase I activities), 15 minutes per sample (for all fractions) for an Associate Scientist, and 2 minutes per sample (for all fractions) by a Scientist.

Data from the field investigations will also require management. Field data from the 1992 and current field programs to be tabulated and/or presented include: water level measurements; temperature, conductivity, and pH measurements; surface water level observations; boring log data; and monitoring well construction information. Analytical data gathered during the site screening completed in 1992 and current field programs will be tabulated and presented as appropriate. Results from the geophysical investigation completed during 1992 will also be presented. LOE for this portion of the data management

subtask are estimated to be 120 hours for an Associate Scientist and 50 hours for a Scientist based on previous experience with management of field data.

Subtask 11.3, U.S. Environmental Protection Agency (USEPA) and Florida Department of Environmental Regulation (FDER) Data Reporting All validated analytical data must be submitted to the USEPA and FDER as required by Section 11.1 of the SOW No. 77. The validated data will be assembled and bound for submission to the regulatory agencies. The data will also be copied onto 3.5-inch floppy disks. Submission of the hard copy and disk copy data will be completed 120 days after a sampling event. The LOE estimated for this task does not include the preparation of an electronic data submission for the USEPA's locational database, which is currently being developed. Estimates of LOE for this task are based on 10 hours per sampled media (surface soil, subsurface soil, sediment, surface water, groundwater, and biota) for a QA Assistant for a total of 60 hours and 2 hours of technical review.

TASK 12, BASELINE RISK ASSESSMENT REPORTS. In accordance with Section 5 (RI/FS), Subsections 5.3.1, 5.3.2, and 5.3.3 (OU 1 reports, OU 2 reports, and OU 7 reports, respectively) of SOW No. 77 dated February 1, 1993, ABB-ES will complete BRA reports (including human health and ecological assessments) for each of the three OUs. ABB-ES will prepare a Navy Draft, Draft, Final Draft, and Final BRA report for each of the three OUs.

Subtask 12.1, OU 1 Baseline Risk Assessment ABB-ES will prepare a BRA for OU 1 in accordance with Subsection 5.3.1 of SOW No. 77 dated February 1, 1993. OU 1 consists of two sites: Site 1, Old Landfill and Site 2, Recent Landfill. Tasks involved in the production of the OU 1 BRA are: completion of the human health risk assessment; completion of the ecological assessment; production, distribution, and review of Navy Draft report; preparation of response to Navy comments and production and distribution of a Draft report; preparation of responses to regulatory agency comments on the Draft BRA, production and distribution of the Final Draft report; and finalization of BRA report for OU 1.

Human Health Risk Assessment (HHRA) ABB-ES will complete an HHRA for OU 1 at NASCF. The HHRA will include the identification of contaminants of concern (COCs), an exposure assessment, a toxicity assessment, a risk characterization, and an analysis of the uncertainties associated with the HHRA. The HHRA will be used to develop the risk information necessary to assist decision making for remedial alternatives at Sites 1 and 2.

The HHRA for inclusion in the BRA includes:

- a discussion of the scope of the HHRA and review of HHRA design;
- a compilation of the facility and site-specific information including location, history, site-specific concerns, and demographic information related to the exposure assessment;
- the selection of COCs by comparison of contaminants detected onsite to contaminants detected in background samples, blanks, and against screening criteria values;
- the determination of exposure point concentrations of those contaminants detected onsite;
- a discussion of the background sampling conducted for the operable unit;
- a discussion of the QA/QC methods used at the operable unit;

- the identification of potentially exposed populations, potentially sensitive populations, and potential exposure scenarios for current and future land-use;
- a toxicity assessment for carcinogenic effects of COCs;
- a toxicity assessment for noncarcinogenic effects of COCs;
- a risk characterization to determine the likelihood that the human population of concern will experience any of the various forms of toxicity associated with exposure to the COCs;
- an uncertainty section and supporting tables that describe the confidence levels associated with the risk estimates calculated in the risk characterization;
- a summary describing the risks associated with the OU taking into account the uncertainties involved in the risk estimates; and
- an appendix containing summary toxicity profiles for each COC including general adverse effects associated with each contaminant and the critical studies on which toxicity values used in the risk assessment are based (including the critical effect, the uncertainty, and the modifying factor used in the calculation).

The HHRA will be completed in accordance with USEPA guidance, and will include, but not be limited to the following:

Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A) (USEPA, 1989);

Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part B), (Development of Risk-based Preliminary Remediation Goals) (USEPA, 1991);

Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Standard Default Exposure Factors (USEPA, 1991);

Guidance for Data Useability in Risk Assessment (Parts A and B) (USEPA, 1992)

Dermal Exposure Assessment: Principles and Applications (USEPA, 1992)

Exposure Factors Handbook (USEPA, 1989); and

Region IV Supplemental Risk Assessment Guidance (USEPA, 1991).

The HHRA will be completed by using, but will not be limited to, the following USEPA data sources for toxicity values:

Integrated Risk Information System (IRIS),
Health Effects Assessment Summary Tables (HEAST), and
USEPA Environmental Criteria and Assessment Office (ECAO).

Prior to receipt of SOW No. 77, ABB-ES had initiated risk assessment activities for OU 1. ABB-ES prepared a *Technical Memorandum for the Human Health Risk Assessment Methodology* (HHRAM) at OUs 1, 2, and 7 to initiate discussion with the regulatory agencies concerning issues in the HHRA that are not related to specific contamination at any of the sites. The HHRAM provided information including: the methodology that will be used in the selection of COCs, exposure scenarios, and exposure assumptions for the HHRA for OUs 1, 2, and 7.

The completion of sampling at OU 1 has been proposed in the *Technical Memorandum for Supplemental Sampling at Operable Units 1, 2, and 7* (ABB-ES, 1992). The final validated data set for all sampling conducted at each site will be provided in electronic form to the Human Health Leader prior to the initiation of work on the HHRA. Also, a records search of private well locations and depths in the area of NASCF is necessary prior to the initiation of the HHRA for the BRA.

Upon completion of the supplemental sampling and analysis at OU 1 and the records search, work to complete the HHRA for OU 1 will be initiated. Activities that will need to be accomplished prior to the completion of the HHRA include:

- a compilation of the facility and site-specific information stated in the HHRAM with modifications suggested by regulatory agencies and the results of the records search;
- an assessment of the analytical data from each site for use in the HHRA;
- the determination of exposure point concentrations of those contaminants detected onsite;
- the selection of COCs by comparison of contaminants detected onsite to contaminants detected in background samples, blanks, and against screening criteria values;
- the justification for the selection of COCs and determination of exposure point concentrations;
- an exposure assessment for current and future land-use as presented in the HHRAM with modifications suggested by regulatory agencies and the results of the records search;
- the verification of the exposure parameters proposed in the HHRAM for use in the exposure scenarios;
- the justification for the selection and implementation of models used to calculate soil to airborne particulate concentrations of COCs, soil to vapor concentrations of COCs, and groundwater to vapor concentrations of COCs;
- obtaining toxicity values (e.g., cancer slope factors [CSF]) for COCs with carcinogenic effects from IRIS and HEAST or USEPA ECAO if current values are not available from any of these sources at the time of the HHRA;
- the development of toxicity values (e.g., CSFs), with concurrence from USEPA Region IV, for COCs with carcinogenic effects if IRIS, HEAST, and USEPA ECAO do not have values available at the time of the HHRA;

- obtaining toxicity values (e.g., reference doses [RfDs] for chronic and subchronic effects) for COCs with noncarcinogenic effects from IRIS and HEAST or USEPA ECAO if current values are not available from any of these sources at the time of the HHRA;
- the development of toxicity values (e.g., RfDs), with concurrence from USEPA Region IV, for COCs with noncarcinogenic effects if IRIS, HEAST, and USEPA ECAO do not have values available at the time of the HHRA;
- a general discussion of the toxicity assessment for carcinogenic effects and noncarcinogenic effects;
- a general discussion of absorption factors, threshold effects, and detoxification effects as they can affect the toxicity of COCs;
- a summarization of the toxicity information generated for each COC;
- the compilation of carcinogenic and noncarcinogenic toxicity information for each COC in a profile that will be included as an appendix to the BRA as required by USEPA Region IV and will also include documentation and justification for each toxicity value used in the HHRA;
- the calculation of cancer risk estimates for each COC at each site for each land-use scenario described in the exposure assessment;
- the calculation of cancer risk estimates for each COC across the OU for each land-use scenario described in the exposure assessment;
- the calculation of hazard quotients for each COC by each exposure route for each land-use scenario described in the exposure assessment;
- the calculation of hazard indices for each COC across exposure routes, where applicable or relevant, for each land-use scenario described in the exposure assessment;
- the justification and calculation of hazard indices and cancer risk estimates for multiple contaminants across multiple exposure pathways, when applicable, for each land-use scenario described in the exposure assessment;
- the justification for the selection and implementation of models used to calculate risk estimates from particulate emissions and vapors released from the soil and the groundwater;
- the qualitative evaluation of tentatively identified compounds (TICs) unless data indicate that a quantitative evaluation must also be undertaken for a particular compound or group of compounds;
- the description of the confidence level used in the calculated hazard indices and carcinogenic risk estimates by examination of the uncertainties associated with the exposure and toxicity assessments; and

- the conclusions of the HHRA taking into account uncertainties discussed in the uncertainty analysis.

The LOE and the associated justification for Subtask 12.1, including composition of the HHRA and the senior review of the text, are summarized in Appendix G and were based on previous experience in preparing HHRA's at other Federal sites. Probability analysis has not been included in the scope of this effort nor has any additional field work been included in the LOE. The Human Health Leader will complete one trip to Tallahassee, Florida, to initiate data management for the HHRA at OU 1.

Ecological Assessment ABB-ES will complete an Ecological Assessment (EA) for OU 1 at NASCF. The EA will include identification of COCs, selection of endpoints, exposure assessment, ecotoxicity assessment, and risk characterization.

The EA will be completed in accordance with the methodology proposed in the *Technical Memorandum for Ecological Assessment Methodology for Operable Units 1, 2, and 7* (ABB-ES, 1992). The methodology is in accordance with USEPA guidance, including:

Risk Assessment Guidance for Superfund, Vol II, Environmental Evaluation Manual (USEPA, 1989);

Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference (USEPA, 1989);

Ecological Assessment of Superfund Sites: An Overview, ECO Update Intermittent Bulletin Series (USEPA, 1991);

Framework for Ecological Risk Assessment; United States Environmental Protection Agency (USEPA, 1992); and

Developing a Work Scope for Ecological Assessment (USEPA, 1992).

The EA for OU 1 includes:

- compilation, organization, and statistical analyses of the analytical data for the purposes of exposure assessment;
- selection of COCs based on comparisons with blank data, background concentrations, and other criteria;
- compilation of the results of the wetlands assessment, habitat mapping, and other environmental setting information as it pertains to exposure assessment;
- selection of endpoints for the aquatic and terrestrial risk assessments;
- identification and characterization of receptors and selection of representative species;
- selection of exposure pathways and exposure routes for receptors;

- completion of an ecotoxicity assessment for aquatic and terrestrial receptors based on literature information for the COCs and selection of toxicity reference values;
- assessment of aquatic ecotoxicity based on toxicity testing and macroinvertebrate sampling;
- assessment of soil ecotoxicity based on toxicity testing;
- calculation of contaminant exposures in the diet of terrestrial representative species based on literature information and chemical concentrations measured in earthworm and plant tissue;
- assessment of potential risks for terrestrial wildlife based on hazard quotients and indices and soil toxicity testing;
- assessment of potential risks for aquatic life based on hazard quotients, toxicity testing, and macroinvertebrate sampling;
- uncertainty analyses that describe the confidence levels associated with the exposure assessment, ecotoxicity assessment, and risk analyses; and
- a summary of ecological assessment results that makes conclusions considering uncertainties.

The LOE and the associated justification for Subtask 12.1 is summarized in Appendix G and is based on previous experience in preparing EAs for other Federal facilities.

Draft BRA Report for OU 1 For this task, ABB-ES will complete the Draft BRA (including human health and ecological assessments) for OU 1 at NASCF. After the Navy Draft BRA is prepared and delivered, a 2-day review meeting will be scheduled with the NRPM and appropriate facility personnel in the ABB-ES Tallahassee, Florida, office. The purpose of the document review meeting is to discuss the Navy Draft BRA, allow discussion of its contents with technical staff from ABB-ES and the Navy, and to gather timely Navy comments to be included in the Draft BRA. The TOM, Technical Expert, FS Leader, RI Leader, Human Health leader, and the Ecology leader will be present at this meeting to discuss site conditions and data analysis findings with the Navy. The effort for meeting preparation and attendance has been included in the LOE. The effort will include preparation of remarks, overheads, handouts, travel to and from the meeting, and attendance at the meeting.

After receipt of comments on the Navy Draft BRA, a response letter will be prepared and submitted to the Navy, and a Draft BRA will be prepared in response to Navy comments and the strategy developed with the Navy. Copies of the Draft BRA will be submitted to applicable addressees. The Navy will provide Points of Contacts and addresses for all addressees. The LOE for this subtask was based on previous experience in preparing Draft reports for BRAs at Federal sites and does not include: substantial revision of the Navy Draft BRA to incorporate Navy comments if the Navy takes a position that is not consistent with USEPA Superfund, Region 4 guidance, or previously agreed upon strategy with ABB-ES.

Final Draft BRA Report Development After the Draft BRA is prepared and submitted, the regulatory agencies will review the document and present the Navy with any comments. ABB-ES will then prepare a response to comments letter for each commenting agency. After the response to comments are

prepared, a 1 day comment review meeting will be scheduled with the NRPM and appropriate facility personnel in the ABB-ES Tallahassee, Florida, office. The purpose of the comment review meeting is to discuss the Draft BRA and clarify all responses to regulatory agency comments to the NRPM prior to the project managers meeting. The TOM, Technical Expert, FS Leader, FS Engineer, RI Leader, Human Health Leader, and the Ecology Leader will be present at this meeting. The LOE for this effort assumes that the comments from the Navy during the response meeting are consistent with previous project scope, strategy, and direction. The effort for meeting preparation and attendance has been included in the LOE. The effort will include preparation of remarks, handouts, and attendance at the meeting.

After submitting responses to comments to the regulatory agencies and incorporating regulatory agency comments into the BRA, the Final Draft BRA will be prepared. The LOE assumes that all agency comments will be timely and will not impact the production of the Final Draft BRA. Further, the LOE for this effort assumes that the comments received from regulatory agencies during the document review will not require alterations to the project scope, strategy, or direction, and that changes to the calculations of risk will not be required. The Navy will provide Points of Contact and addresses for all addressees. The LOE for this subtask was developed based on experience in producing Final Draft BRAs for other Federal sites.

Final BRA According to the FFA, the Final Draft BRA report must be distributed to all involved parties. If after 30 days no party has disputed the conclusions of the BRA report, the Final BRA report will be produced and distributed.

Subtask 12.2, OU 2 Baseline Risk Assessment ABB-ES will prepare a BRA for OU 2 in accordance with Subsection 5.3.2 of SOW No. 77 dated February 1, 1993. OU 2 consists of four sites under investigation: Site 3, Oil and Sludge Disposal Area; Site 4, Grease Pits; Site 5, Oil Disposal Area Northwest; and Site 17, Oil and Sludge Disposal Pit Southwest. Tasks involved in the production of the OU 2 BRA are: completion of the human health risk assessment; completion of the ecological assessment; production, distribution, and review of Navy Draft report; preparation of response to Navy comments, and production and distribution of a Draft report; preparation of response to regulatory agency comments, and production and distribution of the Final Draft report; and finalization of BRA report for OU 2.

Human Health Risk Assessment ABB-ES will complete an HHRA for OU 2 at NASCF. The HHRA will include the identification of COCs, an exposure assessment, a toxicity assessment, a risk characterization, and an analysis of the uncertainties associated with the HHRA. The HHRA will be used to develop the risk information necessary to assist decision making for remedial alternatives at Sites 3, 4, 5, and 17. The elements necessary in the HHRA for inclusion in the BRA and the appropriate guidance that will be adhered to includes those items listed under subtask 12.1.

Prior to receipt of SOW No. 77, ABB-ES had initiated risk assessment activities for OU 2. ABB-ES has prepared and submitted a technical memorandum (TM) for the HHRAM at OUs 1, 2, and 7. Activities conducted for completion of the HHRAM were discussed in subtask 12.1. Upon completion of the supplemental sampling at OU 2 and the records search discussed in subtask 12.1, work to complete the HHRA for OU 2 will be initiated. Activities that will need to be accomplished prior to the completion of the OU 2 HHRA include all those items listed under Subtask 12.1 for OU 1.

The LOE reflects the completion of the facility-specific information and a portion of the summary toxicity profiles prepared during the OU 1 BRA described under Subtask 12.1. Probability analysis has not been included in the scope of this effort nor has any additional field work been included in the LOE.

Ecological Assessment ABB-ES will complete an EA for OU 2 at NASCF. The EA will include identification of COCs, selection of endpoints, exposure assessment, ecotoxicity assessment, and risk characterization. The EA for OU 2 includes all steps as described in Subtask 12.1.

The LOE and the associated justification for Subtask 8.2 were based on previous experience in preparing EAs at other Federal facilities. The LOE for OU 2 reflects completion of the introduction section and a portion of the ecotoxicity assessment during the EA for OU 1.

Draft BRA for OU 2 ABB-ES will complete the Draft BRA (including human health and ecological assessments) for OU 2 at NASCF. Activities to be completed for the development of the Draft BRA for OU 2 are: preparation of the Navy Draft BRA; preparation of response to comments on the Navy Draft BRA; and preparation, production, and distribution of the Draft BRA. Tasks involved in these activities were discussed in subtask 12.1.

Final Draft BRA Development After the Draft BRA is prepared and submitted, the following activities will occur under this subtask: the regulatory agencies will review the document and present the Navy with any comments, ABB-ES will prepare a response to comments letter for each commenting agency, a 1-day comment review meeting will be scheduled, and the Final Draft BRA for OU 2 will be produced and distributed. Tasks involved in these activities were discussed in subtask 12.1.

Final BRA According to the FFA, the Final Draft BRA report must be distributed to all involved parties. If after 30 days no party has disputed the conclusions of the BRA report, the Final BRA report will be produced.

Subtask 12.3, OU 7 Baseline Risk Assessment ABB-ES will prepare a BRA for OU 7 in accordance with Subsection 5.3.3 of SOW No. 77 dated February 1, 1993. OU 7 consists of one site: Site 16, AIMD Seepage Pit. Tasks involved in the production of the OU 7 BRA are: completion of the human health risk assessment; completion of the ecological assessment; production, distribution, and review of Navy Draft report; preparation of response to Navy comments, and production and distribution of Draft report; preparation of response to regulatory agency comments; and production and distribution of the Final Draft report; and finalization of BRA report for OU 7.

Human Health Risk Assessment ABB-ES will complete an HHRA for OU 7 at NASCF. The HHRA will include the identification of COCs, an exposure assessment, a toxicity assessment, a risk characterization, and an analysis of the uncertainties associated with the HHRA. The HHRA will be used to develop the risk information necessary to assist decision making for remedial alternatives at Site 16. The elements necessary in the HHRA for inclusion in the BRA and the appropriate guidance that will be adhered to includes those items listed under Subtask 12.1.

Prior to receipt of SOW No. 77, ABB-ES had initiated risk assessment activities for OU 7. ABB-ES has prepared and submitted a TM for the HHRAM at OUs 1, 2, and 7. Activities conducted for completion of the HHRAM were discussed in subtask 12.1. Upon completion of the supplemental sampling at OU 7 and the records search that was discussed in subtask 12.1, work to complete the HHRA for OU 7 will be initiated. Activities that will need to be accomplished prior to the completion of the OU 7 HHRA include all those items listed in subtask 12.1 for OU 1.

The LOE reflects the completion of the facility-specific information and a portion of the summary toxicity profiles prepared during the OU 1 BRA described under Subtask 12.1. Probability analysis has not been included in the scope of this effort nor has any additional field work been included in the LOE.

Ecological Assessment ABB-ES will complete an EA for OU 7 at NASCF. The EA will include identification of COCs, selection of endpoints, exposure assessment, ecotoxicity assessment, and risk characterization. The EA for OU 2 includes all steps as described in Subtask 8.2 with the exception of the exposure assessment, ecotoxicity assessment, and risk characterization for terrestrial wildlife receptors related to surface soil contamination. The Ecological Assessment Methodology (EAM) did not identify exposure pathways for terrestrial receptors at OU 7.

Draft BRA for OU 7 ABB-ES will complete the Draft BRA (including human health and ecological assessments) for OU 7 at NASCF. Activities to be completed for the development of the Draft BRA for OU 7 are: preparation of the Navy Draft BRA; preparation of response to comments on the Navy Draft BRA; and preparation, production, and distribution of the Draft BRA. Tasks involved in these activities were discussed in Subtask 12.1.

Final Draft BRA Development After the Draft BRA is prepared and submitted, the following activities will occur under this subtask: the regulatory agencies will review the document and present the Navy with any comments, ABB-ES will prepare a response to comments letter for each commenting agency, a 1-day comment review meeting will be scheduled, and the Final Draft BRA for OU 7 will be produced and distributed. Tasks involved in these activities were discussed in Subtask 12.1.

Final BRA According to the FFA, the Final Draft BRA report must be distributed to all involved parties. If after 30 days no party has disputed the conclusions of the BRA report, the Final BRA report is produced.

TASK 13, REMEDIAL INVESTIGATIONS. In accordance with Section 5 (Remedial Investigation/Feasibility Study), Subsections 5.3.1, 5.3.2, and 5.3.3 (OUs 1, 2, and 7 reports, respectively) of the SOW No. 77 dated February 1, 1993, ABB-ES will complete RI reports for Operable Units 1, 2, and 7 at NASCF. These reports will be prepared separately for each of the OUs. The RI reports will examine the nature and extent of contamination associated with former waste disposal practices.

RI for OUs 1, 2, and 7 will be completed in accordance with the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA/540/G-89/004, October 1988) and the *Navy/Marine Corps Installation Restoration Manual* (USN, February 1992). The objectives of the RIs for OUs 1, 2, and 7 are to define the nature and extent of contamination caused by former waste handling and disposal practices and to provide sufficient information for the completion of the BRA and the FS.

Several elements of the RI process, as defined by the USEPA and the Navy IR program, have already been completed for the investigation of OUs 1, 2, and 7. Elements previously completed include: RI/FS scoping; establishment of data quality objectives; development of the RI/FS Workplan, HASP, and SAP; and the initiation of field activities. Task 6 of this POA details the effort and costs to complete the necessary field activities.

Task 13, therefore, presents the LOE and costs for the next two phases of the RI/FS process, the characterization of the nature and extent of contamination at the sites, and preparation of the RI reports. Because this will be completed three times, for Subtasks 13.1, 13.2, and 13.3, the process by which the site characterization is completed and the RI report prepared will be presented once to eliminate

redundancy in this section. LOE estimates for the site characterization and RI reports are presented with Subtasks 13.1, 13.2, and 13.3.

A summary of the site characterization process is presented below. The site characterization to be completed for each of the OUs will consider data in the following primary areas to evaluate the nature and extent of contamination and prepare the RI report.

- Physical Characteristics of the Study Area. The physical setting in which the site exists (topography, hydrology, geology, hydrogeology) will be evaluated and quantified, to the extent possible. Several elements of the field program are designed to acquire data to assist in this evaluation (optical and electronic surveying, generation of boring logs, water level measurements, hydraulic conductivity measurement, geophysical investigations, geotechnical sampling).
- Screening and Laboratory Analytical Results. The results of analytical sampling will be evaluated to characterize the source(s) area, characterize the extent to which the contamination has spread, and to define the nature of the contaminants involved. Full TCL analyses (volatiles, semivolatiles, pesticides, metals, and PCBs) will be completed during the field program (on surface water and sediment samples, groundwater samples, and surface and subsurface soil samples) to facilitate the characterization of the nature and extent of contamination.
- Applicable or Relevant and Appropriate Requirements (ARARs). Laboratory analytical data from the field investigations will be compared with location-specific and chemical-specific applicable or relevant and appropriate State and Federal requirements. This analysis will be completed in conjunction with the FS for each OU. The NASCF ARAR Handbook will be used to perform this evaluation.
- Fate and Transport. The final portion of the site characterization is an evaluation of the fate and transport characteristics of the contaminants identified at each of the operable units. "Fate" refers to eventual outcome of the contaminant's release into the environment; e.g. volatilization, photolysis, hydrolysis, oxidation, chemical specification, complexation, precipitation and coprecipitation, cationic exchange, sorption, bioaccumulation, biodegradation, and biotransformation. "Transport" refers to the mechanism(s) by which the contaminants arrive at their particular fate(s).

Two other elements generally accompany the site characterization, which is completed as part of an RI Report: the Human Health Risk Assessment and an Ecological Assessment. For the investigations of OUs 1, 2, and 7, these two elements of the site characterization process are being addressed separately under Task 12.

The site characterization is developed using the information gathered during the field program. Two field programs completed by ABB-ES will be considered during the site characterizations for each OU. The initial field program was completed in 1991. The confirmatory field program, outlined in the TMSS, will be completed under the present investigation. In addition to these two field programs, the results from historical investigations and background sampling will be also considered.

All of the information collected during the current and 1991 field investigations will be combined into a single database from which a representative data set will be selected. This process of combination and

selection of the data set will involve a detailed analysis of the data gathered. The major steps in this process are defined below.

- Data from each of the media sampled, surface water, sediment, surface soils, subsurface soils, and groundwater, will be considered for the two field investigations.
- Within each media that was sampled, each fraction (volatiles, semivolatiles, metals, pesticides, and PCBs) from the two field investigations will be analyzed and compared. In cases where discrepancies exist between the 1991 data and the current data, a decision based on available information (i.e., fate and transport characteristics of the compound in question, proximity to known source(s), disposal history at the site) will be made and justified regarding which of the reported values will be considered as representative of existing site conditions.
- Following the comparison and selection of a representative data set, the data set will be compared with known historical sampling information. This comparison with historical information will provide valuable information concerning the fate and transport of the contaminants present at each of the OUs by evaluating any changes in contaminant concentrations and locations over time.
- The data set will also be compared with the results of various background samples that have been and will be collected. Background samples can be taken anywhere on the facility (given similar gross physical conditions) and, therefore, background samples collected historically and those from other OUs on the facility need to be considered. The determination of background concentration ranges is especially important in evaluating the nature and extent of contamination for naturally occurring inorganic parameters such as metals.

In addition to the process outlined above for the selection of a representative data set, detailed analysis of the physical data from both investigations will also be required for each of the three OUs. These physical data will include lithologic information from boring logs, water level measurements (for groundwater flow direction and rate and the differentiation of the various aquifers present at the site), hydraulic conductivity testing results, and topography and watershed characteristics.

Following the analysis of this physical information, the data will be summarized and used to develop the fate and transport characteristics of contaminants in site media (i.e., soil, groundwater) and estimates (including use of analytical or numerical models) for groundwater flow and contaminant transport. Physical information concerning fate and transport of contaminants in the various media affected, in conjunction with the characterization of the nature and extent of contamination, will be used in the development of remedial alternatives during the FS.

Detailed analysis of the site screening data will also be completed. This information, from soil gas investigations, geophysical surveys, and onsite laboratory analyses, will also be analyzed during the site characterization and integrated into the overall development of the nature and extent of contamination for each OU in order to achieve the objectives of the RI.

In accordance with Subsection 8.4 of SOW No. 77 dated February 1, 1993, ABB-ES will provide the following support services. It is ABB-ES' understanding that the Navy has contracted with the USGS to monitor surface water conditions and create groundwater numerical models to represent hydrological

conditions at NASCF. As such, ABB-ES will provide support to the USGS as well as coordinate information derived from ABB-ES RI activities at NASCF.

The RI program needs and goals require the USGS to:

- develop a water budget for surface water streams,
- estimate transient high and low flow frequency and conditions,
- develop a verified groundwater flow model capable of estimating potentiometric heads and flow rates,
- characterize groundwater flow paths and discharge areas, and
- identify contaminant flow paths and concentrations for groundwater and subsequent potential exposure points and concentrations for contact (human and ecological) with contaminated groundwater.

The objective of this activity is to support the USGS in their efforts by collecting and providing bimonthly water level measurements, lithologic profiles derived during monitoring well installation, and aiding USGS in the selection of a numerical model, including the assumptions used by the numerical models, that will best address the needs of the IR program.

The IR program requires expertise and experience in contamination assessment in multi-media situations, as well as the ability to maintain an overview of the entire project. ABB-ES proposes to use Willard Murray, Ph.D., P.E., for coordination of this activity. His expertise in all aspects of the RI process and hydrologic modeling will help the USGS project meet the needs of the IR program. The IR program has several numerical modeling objectives.

1. The numerical model(s) should provide a quantitative framework for the geohydrological interpretation of past, current, and future conditions. This framework provides mass balance and potentiometric consistency checks for interpreting site conditions using field measurements. The model(s) should address both specific PSCs or OUs as well as conditions encountered across NASCF.
2. The model(s) will evaluate the appropriate location and estimate performance of groundwater extraction and other flow altering systems as may need to be evaluated during feasibility studies and Record of Decision (ROD) development and design. Evaluation parameters are anticipated to include extraction rates, stagnation points, cone of depression configurations, recharge (or flushing) rates, well design, and configuration required to attain cleanup goals specific to a particular PSC or OU. Evaluations to be supported by this model(s) include intermittent versus continuous operation of extraction systems, effects on nearby surface water hydrology, and estimated contaminant concentrations in extracted groundwater.
3. The model(s) will evaluate transport of contaminants and indicate areas where human or environmental exposure is likely. The evaluation should be capable of defining the rates and direction at which the contaminants will migrate. The model should estimate the concentration likely to be encountered at a particular point at some future time.

Surface Water Modeling Support. In accordance with Subsection 8.4 of SOW No. 77 dated February 1, 1993, ABB-ES will provide the following support services. ABB-ES will act as an adviser and quality control auditor on behalf of the Navy to ensure that the results from the USGS surface water modeling will meet the needs of the RI program.

The USGS surface water monitoring data should allow estimates of the amount of water that passes a particular point along Rowell Creek, and, therefore, allow determinations of groundwater inflow into the creek as a function of stage or creek water level. The streamflow and groundwater inflow data can be used to determine the dilution capacity of Rowell Creek along its length. This information will also be used by the IR program to evaluate the hydraulic connection between Rowell Creek and the surficial aquifer and whether Rowell Creek may receive contaminants from IR program sites at some water level stages (but not at others stages). The model will also provide an estimation of the dilution rate a contaminant would likely undergo if it were released from an RI site.

ABB-ES will perform advisory duties by preparing for and attending one surface water meeting with the USGS per year. The purpose of the meeting will be to review the surface water measurement results and discuss the interaction of surface water and groundwater. In preparation for this meeting, ABB-ES will review field data and interpret site conditions and USGS progress reports to maximize coordination between the two field programs.

In addition, ABB-ES will perform one field audit and summarize its findings in an audit report. The field audit will consist of a visit to each weir, to inspect weir operating conditions, and evaluate potential problems. ABB-ES field personnel will make periodic visits to each weir to ensure that site conditions have not changed.

For pricing purposes ABB-ES will assume the meeting will be held at the USGS office in Orlando. The field audit will be at the weirs installed at NASCF.

The LOE includes 40 hours for the Technical Expert for travel to and from the meeting, meeting preparation, and meeting time. In addition, the Technical Expert will require 2 hours per month to review reports and communicate with USGS and the Navy about the site. The two Senior Scientists will each require 16 hours to attend the meeting and 2 hours per month to perform field checks of the weir and measuring equipment and review USGS reports.

The LOE includes 30 hours for the Technical Expert to travel to the site, perform a field audit, and document the results.

Lithologic Support. In accordance with Subsection 8.4 of SOW No. 77 dated February 1, 1993, ABB-ES will provide the following services. The key information required for a successful groundwater modeling project is description and interpretation of the subsurface conditions through which groundwater and contaminants migrate. The continuity, orientation, chemical make-up, and stratification of these aquifer materials greatly affects groundwater flow and, therefore, the complexity of the modeling efforts.

The lithologic logs will be developed during the installation of monitoring wells, borings, and other subsurface explorations. These logs will describe the subsurface materials encountered during monitoring well construction. Historical lithologic logs, compiled from NASCF records, will also be included.

In addition, ABB-ES will collect and analyze the following aquifer parameters.

- Slug tests will be performed on selected wells to estimate the hydraulic conductivity around the well screen.
- Vadose zone geotechnical analyses will be performed (i.e., hydrometer test and Atterberg limits, cation exchange capacity, bulk density, and total organic carbon [TOC] content).
- Samples from the monitoring well screen interval will be collected and analyzed for grain size distribution.
- Aquifer performance tests including pumping tests will be performed at selected sites.

This information and the lithologic logs will be provided to the USGS in accordance with a mutually agreed schedule and format.

The LOE includes 40 hours for the Technical Expert for his travel to the meeting, meeting preparation, and attending each of the three meetings. In addition, the Technical Expert will need 4 hours per month to review reports and discuss the RI and groundwater modeling issues with the USGS and Navy. The two Senior Scientists will each require 16 hours to attend the three meetings and 2 hours per month to review documents and perform activities identified during the meetings.

Groundwater Modeling Support. In accordance with Subsection 8.4 of SOW No. 77 dated February 1, 1993, ABB-ES will assist the USGS in their modeling efforts. Assistance will be provided in identifying the groundwater modeling goals, selection of appropriate groundwater model(s), and defining the assumptions needed for a successful integration of the USGS model(s) into the IR program. The IR program needs require expertise and experience in contamination assessment in multi-media situations, as well as the ability to maintain an overview of the IR program activities. In addition, Dr. Murray will provide the communications link between the USGS field program and ABB-ES' remedial investigation activities.

ABB-ES shall prepare for and attend three groundwater workshops or meetings. The preparation will include review of existing USGS progress reports, ABB-ES RI field activities, and interpretations of site conditions. For pricing purposes it will be assumed that two meetings will be held at the USGS offices in Orlando, Florida, and one meeting will be at NASCF.

As described above, the USGS is providing numerical surface water and groundwater modeling services to the IR program at NASCF. Model specifications and schedules are being developed with the USGS to provide ABB-ES with quantitative estimates of current and future contaminant concentration distributions and to provide a quantitative framework for verifying the conceptual understanding of site hydrogeologic and chemical transport and fate processes at the site. The models, also to be used during the FS, are not anticipated to be available for OU 1 (RI and FS due November 1993) and may not be available on a specific OU basis for OUs 2 and 7. Therefore, level of effort has been included for a limited modeling effort (using ModFlow) by ABB-ES to complete these deliverables.

Illustrations will be prepared for presentation of analytical results from the 1992 and current investigations. These figures will show the spatial distribution of the contaminants detected. Separate figures will be prepared for each OU (or sites within the OU for OU 2) showing the sampling locations and analytical results from sampling of surface water, sediment, biota, surface soil, subsurface soil, and

groundwater. As full TCL sampling will be completed for each medium identified above, illustrations summarizing the pertinent analytical results from each analytical fraction (volatiles, semivolatiles, pesticides, metals, and PCBs) will be prepared and presented.

Following the site characterization, briefly outlined above, the RI report will be completed for each OU. The outline for the RI reports will be as follows.

- Executive Summary summarizes major findings of the investigation and its conclusions and recommendations.
- Introduction defines the purpose of the report, describes the site, summarizes the site history, and presents the results of previous investigations.
- Study Area Investigation details the field programs that have been completed, including specific sampling locations, and the physical and laboratory analytical data collected from each.
- Physical Characteristics of the Study Area describes the physical setting in which the site exists and presents the results of field activities designed to characterize the site's physical characteristics.
- Nature and Extent of Contamination describes the contaminants detected from each fraction analyzed in the various media considered, the levels at which the contaminants were detected, and their vertical areal extent. Descriptions will be quantitative to provide the basis for evaluating technologies and alternatives during the FS.
- Contaminant Fate and Transport describes the fate and transport characteristics of the contaminants detected relative to the nature and extent of contamination observed in the various media sampled.
- Summary and Conclusions summarize the major findings of the investigation and present the conclusions developed during the site characterization.

This site characterization process and the preparation of RI reports will be completed for each of the three OUs considered. Development of costs and LOE for the remedial investigations included in this task are presented in the following subtasks:

- 13.1, Remedial Investigation for OU 1;
- 13.2, Remedial Investigation for OU 2; and
- 13.3, Remedial Investigation for OU 7;

Subtask 13.1, Remedial Investigation for OU 1 OU 1 consists of two PSCs: Site 1, Old Landfill and Site 2, Recent Landfill. Completion of the RI for OU 1 has been divided into the following subtasks: Site Characterization for OU 1, Draft RI report for OU 1, Final Draft RI report for OU 1, and Final RI report for OU 1.

Site Characterization for OU 1 The process by which the site characterization will be completed for OU 1 is presented above under Task 13.

Draft RI Report for OU 1 For this task, ABB-ES will complete the Navy Draft RI report for OU 1 at NASCF. Tasks involved with the development of the site characterization, on which the RI Report is based, are presented above under Task 13. Following the initial preparation of the Navy Draft report, the document will be submitted for internal ABB-ES review. The document will be modified pursuant to those comments and submitted to the Navy.

After the Navy Draft RI report is prepared and delivered, a review meeting will be scheduled with the NRPM and appropriate facility personnel in Tallahassee, Florida. The purpose of this document review meeting is to discuss the findings and conclusions presented in the report with ABB-ES staff and the Navy. Navy comments will also be presented at this meeting so that the Draft RI report can be completed in a timely fashion for delivery to the regulators and TRC. The TOM, Technical Expert, RI Leader, RI Scientists, and the FS Leader will be present at the document review meeting.

Following the document review meeting and the receipt of Navy comments, the Navy Draft will be modified as directed by the Navy comments and in a manner that reflects the discussions and decisions from the document review meeting. The completed Draft RI report will be briefly reviewed by ABB-ES. Transmission of the document will be made to the USEPA, the FDER, and the other members of the TRC.

The LOE for this task is developed based on previous experience in addressing Navy comments and assumes that the RI report will follow the schedule presented in Appendix C and that the document review meeting can be completed in 2 days.

Final Draft RI Report for OU 1 After the Draft RI report has been submitted to the regulatory agencies and the TRC, comments on the report will be sent to the NRPM. Upon receipt of comments, ABB-ES will prepare a response to comments letter within 25 days. After the response to comments is prepared, a comment review meeting will be held with the NRPM, appropriate NASCF personnel, and ABB-ES technical staff in Tallahassee, Florida. The purpose of this review meeting is to discuss all Draft RI report comments and the responses prepared. The comment review meeting will be attended by the following ABB-ES personnel: TOM, Technical Expert, RI Leader, RI Scientists, and the FS Leader.

The comment response letter will be mailed to the regulatory agencies and the TRC following the comment review meeting. The LOE prepared for this task assumes that the comment responses can be resolved in a 2-day meeting with the Navy and that all comments are received within the time frames provide in the SMP.

Following the comment review meeting and the transmission of the response to comments letter, the Final Draft RI report will be prepared. The Draft report will be modified as directed by the Navy to address the regulatory and TRC comments in a manner that reflects the discussions and decisions from the comment review meeting as outlined in the response to comments letter. LOE for this subtask assumes that all of comments to the Draft RI report will have been received prior to the comment review meeting. LOE for this subtask was developed based on experience in addressing regulatory and TRC comments for other CLEAN projects.

Final RI Report for OU 1 In accordance with the FFA, the USEPA and FDER have 30 days to dispute the findings and conclusions presented in the Final Draft RI report. If the Final Draft RI is not disputed by the regulatory agencies, a Final RI report will be prepared and distributed. LOE estimates for this subtask assume that the Final Draft will not be disputed.

Subtask 13.2, Remedial Investigation for OU 2 Operable Unit 2 consists of four PSCs: Site 3, Oil/Sludge Disposal Pits; Site 4, Grease Pits; Site 5, Oil Disposal Area Northwest; and Site 17, Oil/Sludge Disposal Pit Southwest. Completion of the RI for OU 2 has been divided into the following subtasks: Site Characterization for OU 2, Draft RI report for OU 2, Final Draft report for OU 2, and Final RI report for OU 2. LOE and costs estimated for this task assume that sufficient information will be gathered, during the limited scope of field activities outlined in Task 8, to complete an RI for PSC 4.

Site Characterization for OU 2 The process by which the site characterization will be completed for OU 2 is presented above. The site characterization for OU 2 will be more involved than that completed for OU 1. Four separate sites are included in OU 2, each of which have a unique age, unique physical setting, and differing contaminants. These differences may cause separate fate and transport conditions, which will need to be described in separate nature and extent of contamination sections.

Draft RI Report for OU 2 Work to be completed under this task for the completion of the OU 2 RI report is described in Subtask 13.1.

Final Draft RI Report for OU 2 Work, travel, and meetings to be completed under this task for the OU 2 RI report are described in Subtask 13.1.

Final RI Report for OU 2 Work to be completed under this task for the OU 2 RI report is described in Subtask 13.1.

Subtask 13.3, Remedial Investigation for OU 7 OU 7 consists of Site 16, the AIMD Seepage Pit. Completion of the RI for OU 7 has been divided into the following subtasks: Site Characterization for OU 7, Draft RI report for OU 7, Final Draft RI report for OU 7, and Final RI report for OU 7.

Site Characterization for OU 7 The process by which the site characterization will be completed for OU 1 is presented above under Task 13.

Draft RI Report for OU 7 Work to be completed under this task for the completion of the OU 7 RI report is described in Subtask 13.1.

Final Draft RI Report for OU 7 Work, travel, and meetings to be completed under this task for the OU 7 RI report are described in Subtask 13.1.

Final RI Report for OU 7 Work to be completed under this task for the OU 7 RI report is described in Subtask 13.1.

TASK 14, PREPARE A TREATABILITY STUDY WORKPLAN FOR OU 2. A workplan will be prepared to conduct treatability studies designed to evaluate the feasibility of applying different remedial technologies to reduce the concentrations of target compounds in soil and groundwater at OU 2. Treatability studies are required if insufficient information is available about the effectiveness of the application of a remedial technology at a specific site. Treatability testing is used to provide additional information about technology performance, design specifications, and cost. This information can then be incorporated into the OU 2 Remedy Selection/Feasibility Study.

There are three levels of treatability testing as described in the *Guide for Conducting Treatability Studies under CERCLA* (EPA/540/R-92/071a):

- Remedy Screening,
- Remedy Selection (Bench-Scale/Pilot-Scale), and
- Remedial Design/Remedial Action (RD/RA) Treatability (Pilot-scale/Full Scale).

This workplan will only address treatability testing that falls within Remedy Screening or Remedy Selection testing. The type of testing required will be decided only after chemical and physical site information has been reviewed and data gaps identified. Initial screening tests will be conducted to make a preliminary evaluation of technology performance, and remedy selection testing will be conducted in a manner that simulates the treatment process so that performance, design, and cost data can be generated.

Prior to preparing the Treatability Study Workplan (TSWP) for OU 2, a task has been included to review applicable technologies and prepare recommendations for treatability testing. A description of the tasks, schedule, and budget required to review data and prepare the TSWP OU 2 is presented in this section of the POA. Assumptions concerning the number of technologies that require treatability testing have been made based on initial review of site data and are described. As additional data become available, the number of technologies to be evaluated and level of effort for this task may need to be re-evaluated.

Subtask 14.1, Identify Technologies for Treatability Testing The existing chemical data available in the September 1992 TMSS at OU 2 will be reviewed to establish the type and extent of contamination at each PSC within OU 2. Some of the target compounds that have been identified in soil and groundwater at different PSCs at OU 2 include:

- toluene,
- xylene,
- methylene chloride,
- 1,1,1 trichloroethane,
- trichloroethene,
- naphthalene,
- phenol,
- iron,
- lead, and
- chromium.

This task is designed to be a preliminary assessment of applicable technologies based on available site data. The technologies that appear as though they would be an effective method of remediating soil and groundwater, but require treatability testing, will be identified. This review will be conducted in conjunction with the OU 2 FS. Based upon initial review of chemical data, bioremediation and vapor extraction are remedial technologies being considered for testing for the removal of organic target compounds at OU 2 PSCs. Other technologies such as ultraviolet (UV) oxidation and carbon adsorption may also be considered if bioremediation is not effective for groundwater remediation. The site data need to be examined more closely, however, to determine the best application of these technologies at these sites.

Chemical pretreatment procedures will be identified for sites that contain inorganics at concentrations that require treatment prior to discharge and that contain levels of iron or magnesium concentrations that would interfere with processes to remove organics.

Data will also be reviewed to make a preliminary assessment about the feasibility of combining soil and/or water from different sites at OU 2 for treatment. This may apply if a biological land treatment application is chosen for testing, where it may be desirable to treat all of the soil together rather than separately. Based on initial review of results from total petroleum hydrocarbon (TPH) and semivolatile analysis, it appears that there may be petroleum fuel contamination at PSCs 3, 5, and 17. PSC 4 data will be reviewed; however, no remedial action may be required. Chromatograms will be examined to evaluate the type of petroleum contamination that may be present at the four sites and whether materials are similar enough to be combined for treatability testing. The soil characteristics and hydrogeology will also be reviewed from each site to determine if *in-situ* remedial technologies can be considered.

A list of potential treatment technologies will be prepared for each site based upon review of chemical and physical data. The most promising remedial technologies that require treatability testing will be identified. Other technologies, such as carbon adsorption or UV oxidation, may be required as part of a treatment process for either polishing or as an alternative to initial technologies chosen for testing if performance criteria are not met. Rather than testing all possible technologies, it is more cost effective to create a workplan that is based on a decision tree; therefore, recommendations for testing are made only when needed. This decision matrix will be developed as part of this task.

Prior to initiating this task, a site visit will be made by the ABB-ES Wakefield, Massachusetts, TOM and the Principal Scientist. This will be followed by an initial scoping meeting that will be held in the Tallahassee office. This task will be conducted by personnel in the Wakefield, Massachusetts, office involved with treatability testing. Discussions will also take place with other key project personnel from Tallahassee and Washington, D.C., involved with the sampling and conducting the OU 2 FS.

Subtask 14.2, Prepare Treatability Study Workplan A TSWP will be prepared in accordance with the directions given in the SOW to conform with USEPA guidance. The TSWP will describe testing objectives and procedures for technologies chosen for testing in Subtask 14.1. The treatability studies will be designed to develop site-specific information pertaining to technology performance, design, and cost.

The TSWP will be prepared in accordance with the *Guide for Conducting Treatability Studies under CERCLA* (EPA/540/R-92/071a). The TSWP outline will include:

- project description,
- treatability technology description,
- test objective,
- experimental design and procedures,
- equipment and materials,
- sampling and analysis,
- data management,
- data analysis and interpretation,
- health and safety,
- residuals management,
- community relations,
- reports,

- schedule,
- staffing, and
- budget.

The preparation of the TSWP will begin once the technologies recommended for treatability studies are agreed upon by the Engineer-in-Charge (EIC) and ABB-ES. Based on review of current information, two technologies have been identified for treatability evaluation: bioremediation and vapor extraction. (This assumption is subject to change, however, based on results from Subtask 14.1). The volatile aromatics, semivolatile compounds, and apparent source material at OU 2 are responsive to treatment using those technologies. If either of these technologies do not meet performance criteria, other technologies will be evaluated. At this point, it is assumed that the following treatability tests will be conducted to evaluate the feasibility of vapor extraction and bioremediation applications at the following sites at OU 2.

Soil Treatment.

1. **Bioremediation, Land Treatment:** Soil from Sites 3, 5, and 17 will be combined and tested. Site 4 will be included if testing is warranted. The rate and extent of target compound removal will be measured. The testing process may include an initial biodegradation screening test in a slurry where target compound degradation is confirmed. If it is positive, then a treatment simulation will be conducted measuring rate and extent of biodegradation for a soil pile or landfarm.
2. **Vapor Extraction and Bioventing:** The feasibility of using vapor extraction and/or bioventing to remove volatile and semivolatile organic compounds from vadose soil will be evaluated for Sites 5 and 17. Treatability testing will be conducted using soil columns and the amount of material that is removed by vapor extraction and biodegradation will be measured.

Groundwater Treatment.

1. **Bioremediation, In-Situ:** The feasibility of using aerobic *in-situ* bioremediation to remove target chemicals at Sites 5 and 17 will be evaluated. These tests will include initial screening tests to determine if target compounds are biodegradable. If the screening tests are positive, a treatment simulation will be carried out using soil columns.

Methylene chloride has been detected in Site 17 groundwater. Numerous studies have reported aerobic degradation of methylene chloride, and it should be considered for testing. If the screening test for Site 17 shows that methylene chloride is not biodegradable in this specific matrix, then UV oxidation will be evaluated for that site.

2. **Chemical Precipitation and Flocculation:** Removal of inorganics may be required if concentrations exceed treatment goals and iron and manganese removal will probably be required for most remedial applications (i.e., aerobic biodegradation, UV oxidation, and carbon adsorption) that would be used to remove organics from groundwater. Oxidation methods such as adding hydrogen peroxide and coagulation and flocculation methods will be evaluated for OU 2 groundwater composited from each of the sites that have high levels of target compounds.

3. **UV Oxidation:** UV oxidation will be evaluated if biological treatment does not prove to be effective for Site 17. Methylene chloride, which may be treatable by bioremediation or carbon adsorption, has been detected at Site 17. UV oxidation testing may be conducted in the laboratory or in the field.
4. **No Treatment:** The fate of target chemicals in the saturated zone can be measured in the laboratory under simulated field conditions. Soil sampling, with microbiological and chemical analyses, can also provide insight into the likelihood that unaided biodegradation is already occurring. This information can be used to determine if natural attenuation is occurring and if any treatment or augmentation of natural processes is required. This information coupled with site data can be used to determine if the plume disappears before discharging to surface water or approaching any receptors.

The SOW requires the following TSWP submittals:

- Draft TSWP,
- Response to Navy Comments, and
- Final TSWP.

The TOM, Technical Lead, Principal Engineer, and Technical Expert will develop project and site-specific testing procedures based on review of site data. Several other specialists will be consulted and will contribute to the preparation of the TSWP. The ABB-ES Health and Safety Officer for the OU 2 field work will work with the core team to identify and produce any required amendments or revisions to the RI HASP required by the treatability testing.

A community relations section will not be developed for the treatability study; rather, it will reference the existing plan developed for the NASCF program.

The Principal Scientist from the ABB-ES Wakefield office will meet with the Tallahassee project team at the 75 percent completion point. ABB-ES will receive comments on the draft TSWP and respond to them within 14 days. To expedite the review and response cycle, a meeting with key Navy personnel is recommended after ABB-ES' receipt of NAVY comments. The LOE for this task assumes no significant data gaps.

TASK 15, GROUNDWATER TREATABILITY STUDY, OU 7. A groundwater treatability study will be performed to evaluate pretreatment options for heavy metals removal and carbon adsorption for primary treatment. The treatability study will be performed in accordance with the following documents:

- *Treatability Study Workplan Operable Unit 7* (ABB-ES, April 1992); and
- *Guide for Conducting Treatability Studies Under CERCLA* (EPA/540/2-89/058, December 1989).

The TSWP for OU 7 was submitted in draft form to the Navy in April 1992. The workplan was submitted in draft form to USEPA, FDER, and TRC members in May 1992. No comments were received. Therefore, ABB-ES assumes the Navy wishes to implement the workplan and will finalize the workplan and execute it, as is, in accordance with Task 12 of the SOW.

The treatability study will be conducted by one Chemical Engineer from ABB-ES Portland, Maine, and one Senior Environmental Engineer from ABB-ES Tallahassee, Florida. Onsite gas chromatograph (GC) analysis will be provided by the ABB-ES subcontractor providing mobile laboratory support for the implementation of the TMSS.

Performance of the treatability study will consist of five subtasks as outlined below.

Subtask 15.1, Mobilization and Demobilization All experimental laboratory equipment will be mobilized to the site from ABB-ES Portland. Equipment includes items such as pumps, oven, balance, stir plates, spectrophotometer, desiccator, beakers, and Imhoff cones. Expendable supplies that are not in stock will be ordered and mobilized to the site from ABB-ES Tallahassee. Supplies include items such as GC standards, chemicals, reagents, and filters. The mobile laboratory will be onsite before execution of this treatability study. Mobilization and demobilization for one Chemical Engineer will require 40 hours, of which 16 will be travel time. Mobilization and demobilization for one Senior Engineer will require 24 hours, of which 8 will be travel time.

Subtask 15.2, Execute Treatability Study Execution of the treatability study will require five 10-hour days at the site by both Engineers with the Technical Expert available to answer questions by phone.

Subtask 15.3, Data Management and Evaluation After execution of the treatability study, field analytical results will be put into electronic, table format. When outside laboratory analytical results are received (approximately 30 days after execution of the treatability study), they will be put into electronic, table format.

The completed data package will then be evaluated. All analytical results will be presented in the final report. This effort will take 60 hours of engineering, 16 hours of technical expertise, and 12 hours of word processing time.

Subtask 15.4, Residuals Management Approximately 100 gallons of wastewater and precipitation sludge will be generated during the execution of the treatability study. Residuals will be placed into two 55-gallon drums. These drums will be labeled and sampled by ABB-ES and analyzed by an offsite laboratory for TCLP, ignitability, corrosivity, and reactivity. Once analytical results are received, ABB-ES will evaluate the data and arrange for final disposition. If hazardous, the drums will be transported to the NASCF Hazardous Waste Temporary Storage and Disposal (TSD) Facility for final disposition. If non-hazardous, the drums will be transported to the NASCF Wastewater Treatment Plant (WWTP) for disposal. All analytical results will be presented in the final report. This effort will require 24 hours of engineering, 4 hours of technical expertise, and 4 hours of word processing time.

Subtask 15.5, Treatability Study Report The treatability study report will contain a summary of the tests performed, the data generated, and an evaluation of the data. At each decision step, the rationale and the data that form the basis for the decision will be discussed. The final section will contain a recommendation and rationale for the recommendation of a particular treatment process. If further treatability testing (e.g., pilot-scale) is needed to support remedial design, the report will identify that need.

The report will follow USEPA guidance found in *Guide for Conducting Treatability Studies Under CERCLA* (USEPA 1989) to the extent possible. In accordance with the Administrative Order, the treatability study report will include a summary of tests performed, test results, analysis and interpretation of data, and an assessment of the effectiveness of each treatability technology. This effort will require

100 hours of engineering, 24 hours of technical expertise, 40 hours of CAD work, 8 hours of technical editing, and 24 hours of word processing time.

TASK 16, FEASIBILITY STUDIES. In accordance with Section 5 (Remedial Investigation/Feasibility Study), Subsections 5.3.1, 5.3.2, and 5.3.3 (OU 1 reports, OU 2 reports, and OU 7 reports, respectively) of SOW No. 77 dated February 1, 1993, ABB-ES will complete FS reports for OUs 1, 2, and 7. These reports will be prepared separately for each of the three OUs. These reports will include the identification of remedial action objectives, a review of ARARs, the identification and screening of remedial technologies, the development and screening of remedial alternatives, the detailed analysis of remedial alternatives, and a comparative analysis of all remedial alternatives. ABB-ES will prepare a Navy Draft, Final Draft, and Final FS report for each of the three OUs: 1, 2, and 7.

Tasks involved in the development of an FS are presented in Exhibit 1. The FS includes:

- a compilation, analysis, and quantitative summary of the nature and extent of contamination, apparent transport mechanisms for contaminants, and the human and ecological risk assessments;
- the identification and summary of ARARs; these ARARs will be summarized from the NASCF ARAR Handbook previously prepared by ABB-ES;
- the development of remedial action objectives and target clean-up levels;
- the identification and description of a range of technologies for remedial action;
- the screening of technologies based on cost, implementability, and effectiveness;
- the development of alternatives including assembling technologies that pass the screening phase into appropriate alternatives to address all contaminated media at the OU;
- the screening of remedial alternatives based on cost, implementability, and effectiveness.
- detailed analysis of alternatives that pass the screening phase based on nine criteria (Exhibit 2), including a cost estimate and sensitivity analysis; and
- a comparative analysis of all alternatives in order to compare remedial action alternatives with each other based on the nine criteria.

These tasks are identified and discussed in the following two guidance manuals.

U.S. Environmental Protection Agency, 1990, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, Interim Final: Office of Emergency and Remedial Response, Washington, DC, EPA/540/G-89/004, October 1990.

U.S. Navy, 1992, *Installation Restoration Program Manual*: February 1992.

Subtask 16.1, Feasibility Study for OU 1 ABB-ES will prepare an FS for OU 1 in accordance with Subsection 5.3.1 of SOW No. 77 dated February 1, 1993. OU 1 consists of two PSCs: Site 1, Old Landfill and Site 2, Recent Landfill. Tasks involved in the production of this report are: completion of

EXHIBIT 1
FEASIBILITY STUDY

- I. Definition of Nature and Extent of Contamination and Identification of Transport Processes
- II. Human Health and Ecological Risk Assessments
- III. Definition of Applicable and/or Relevant and Appropriate Requirements
- IV. Definition of Remedial Action Objectives and Target Clean-up Levels
- V. Identification of Remedial Technologies
- VI. Screening of Remedial Technologies
 - Cost
 - Implementability
 - Effectiveness
- VII. Development of Remedial Action Alternatives
- VIII. Screening of Remedial Action Alternatives
 - Cost
 - Implementability
 - Effectiveness
- IX. Detailed Analysis of Remedial Action Alternatives
- X. Sensitivity Analysis of Alternatives
- XI. Comparative Analysis of Alternatives

EXHIBIT 2
NINE CRITERIA FOR DETAILED ANALYSIS

- I. Overall Protection of Human Health and the Environment
- II. Compliance with ARARs
- III. Long-term Effectiveness and Permanence
- IV. Reduction of Mobility, Toxicity, or Volume through Treatment
- V. Short-term Effectiveness
- VI. Implementability
- VII. Cost
- VIII. State (Support Agency) Acceptance *
- IX. Community Acceptance *

* Typically, detailed analysis of these criteria are evaluated during the responsiveness summary after the public comment period for the FS.

the feasibility study; production, distribution, and review of Navy Draft report and Draft report; review of draft report, preparation of response to comments, and production and distribution of the final draft report; and finalization of the FS report for OU 1.

Feasibility Study for OU 1 ABB-ES will complete a feasibility study for OU 1 at NASCF. The RI report will be used to provide data sufficient to define the nature and extent of contamination, identify target clean-up levels, identify remedial action objectives, identify and screen appropriate technologies and alternatives, and review ARARs for this OU. Because wastes characteristic of solid waste were disposed at these two landfills, the USEPA guidance manual *Streamlining the RI/FS for CERCLA Municipal Landfill Sites* will be used to the extent practicable in order to limit the number of alternatives evaluated for the FS for OU 1.

Prior to receipt of SOW No. 77, ABB-ES had initiated FS activities for OU 1. ABB-ES has prepared and submitted a Technical Memorandum for the Initial Screening of Source Control Remedial Alternatives at OU 1. This technical memorandum was written to address source control (i.e., landfill capping alternatives) for OU 1. ABB-ES initiated these activities because USEPA guidance for conducting FSs at CERCLA landfill sites suggest that it is appropriate to identify a limited number of remedial alternatives for each general response action. In the case of OU 1, ABB-ES preliminarily identified several alternatives for the containment general response category and two alternatives for the treatment general response category. Other activities that occurred during the preparation of this technical memorandum included: an introduction section was written that included a preliminary description of the nature and extent of contamination completed to date for OU 1; the identification and description of ARARs for OU 1 at NASCF; the preliminary identification and description of a limited range of technologies for remedial action; the preliminary screening of technologies based on cost, implementability, and effectiveness; the preliminary development of alternatives including assembling technologies that passed the screening phase into appropriate alternatives to address all the landfills; and the screening of alternatives based on cost, implementability, and effectiveness. Upon completion of the supplemental sampling and analysis at OU 1, the FS for OU 1 will be implemented. Activities that will be conducted for OU 1, in order to complete the FS, are as follows.

- A compilation, analysis, and qualitative summary of the nature and extent of contamination and the risk assessment will be completed for the RI under Tasks 11 and 12.
- A meeting will be held in the ABB-ES Tallahassee, Florida, office to discuss the identification of remedial action objectives and target clean-up levels for OU 1. The following personnel will be involved: NRPM, TOM, FS Leader, FS Engineers (2), RI Leader, Human Health Risk Assessment Leader, Ecological Risk Assessment Leader, and the FS Technical Expert;
- Remedial technologies previously identified for source control at OU 1 (i.e., 11 technologies) will be re-evaluated and additional remedial technologies will be included if necessary. In addition, remedial technologies to address groundwater contamination at the OU will be identified and screened.
- The development of source control remedial alternatives identified for OU 1 (i.e., four) will be re-evaluated and additional alternatives will be included and screened as necessary. Also, remedial alternatives will be developed to address groundwater contamination at the OU.

- A detailed analysis (based on nine criteria presented in Exhibit 2) of alternatives that pass the screening phase will be developed. This analysis includes a cost estimate and a sensitivity analysis of cost, quantities, and residual risk. It is anticipated that six alternatives for each site (i.e., three for source control and three for groundwater) will undergo detailed analysis.
- A comparative analysis of all alternatives (i.e., a total of 12) will be included in order to compare remedial action alternatives with each other based on the nine criteria.
- A meeting will be held in the ABB-ES Tallahassee, Florida, office to orally present the conclusions of the feasibility study. The following personnel will be involved: NRPM, TOM, FS Leader, FS Engineers (2), FS Technical Expert, RI Leader, Human Health Risk Assessment Leader, and the Ecological Risk Assessment Leader.

The LOE and the associated justification for Subtask 16.1 were based on previous experience in preparing FSs at other private and Federal sites. Any additional field work necessitated by Navy review is not anticipated and, thus, is not included in the scope of this effort.

Draft FS Report for OU 1 Once the conclusions of the FS are agreed upon by the Navy and ABB-ES, ABB-ES will complete the Navy Draft FS report for OU 1 at NASCF. An outline of a typical FS report is included in Exhibit 3. A Navy Draft FS report, following the guidelines of Exhibit 3, will be prepared for submittal to the NRPM and NASCF personnel.

After the Navy Draft FS report is prepared and delivered to the Navy, a review meeting will be scheduled with the NRPM and appropriate facility personnel in the ABB-ES Tallahassee, Florida, office. The purpose of the document review meeting is to discuss the Navy Draft FS report with the Navy, allow discussion of its contents with cognizant professional staff and the Navy, and to gather timely Navy comments to be included in the Draft FS report. The TOM, FS Leader, and FS Engineers will be present at this meeting to discuss site conditions and data analysis findings with the Navy. The LOE for this effort assumes that the comments during the document review meeting from the Navy are consistent with previous project scope, strategy, and direction, and that substantial changes to the format and content of the Navy Draft FS Report are not required.

After receipt of the Navy's comments on the Navy Draft FS Report, a Draft FS report will be prepared in response to Navy comments and the strategy developed with the Navy. Copies of the Draft FS report will be submitted to applicable addressees. The LOE assumes that:

- all comments to be addressed and all revisions to be made to the Draft FS report will be based on comments received prior to the start of this subtask;
- revisions requiring reanalysis of alternatives or addition of new alternatives is not within the scope of this SOW;
- revisions are limited to editorial or stylistic changes, or clarification of scope, analysis, evaluation, recommendations, policy;
- no meetings will be required with the Navy;

EXHIBIT 3
FEASIBILITY STUDY REPORT OUTLINE

- 1.0 INTRODUCTION
 - 1.1 THE CERCLA FEASIBILITY STUDY PROCESS: DISCUSSION OF THE FS PROCESS ACCORDING TO CERCLA
 - 1.2 PURPOSE AND SCOPE OF THE FEASIBILITY STUDY FOR OU 1: DISCUSSION OF HOW THE FS PROCESS IS IMPLEMENTED FOR OU 1
- 2.0 OPERABLE UNIT 1 OVERVIEW
 - 2.1 SITE DESCRIPTION
 - 2.2 SITE HISTORY
 - 2.3 ENVIRONMENTAL CONTAMINATION ASSESSMENT:

Provide a description of the compilation, analysis, and quantitative summary of the nature and extent of contamination, apparent transport mechanisms for contaminants, and the human and ecological risk assessment for OU 1
 - 2.4 OVERVIEW OF CONTAMINATION AT OU 1:

Identify media of concern at OU 1
- 3.0 BASELINE RISK ASSESSMENT OVERVIEW
 - 3.1 HUMAN HEALTH RISK EVALUATION
 - 3.2 ECOLOGICAL RISK EVALUATION
- 4.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
 - 4.1 LOCATION-SPECIFIC ARARS
 - 4.2 CHEMICAL-SPECIFIC ARARS
 - 4.3 ACTION-SPECIFIC ARARS
- 5.0 IDENTIFICATION OF REMEDIAL ACTION OBJECTIVES
 - 5.1 REMEDIAL ACTION OBJECTIVES AND TARGET CLEANUP LEVELS
 - 5.1.1 Site 1
 - 5.1.2 Site 2
 - 5.2 IDENTIFICATION OF VOLUME OF MEDIA OF CONCERN
 - 5.2.1 Site 1
 - 5.2.2 Site 2
 - 5.3 GENERAL RESPONSE ACTIONS

EXHIBIT 3 (continued)
FEASIBILITY STUDY REPORT OUTLINE

- 6.0 DEVELOPMENT OF REMEDIAL ALTERNATIVES FOR SITE 1
 - 6.1 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES
 - 6.2 DEVELOPMENT OF REMEDIAL ALTERNATIVES
 - 6.3 SCREENING OF REMEDIAL ALTERNATIVES
 - 6.3.1 Alternative 1
 - 6.3.2 Alternative 2, etc.
 - 6.3.i Alternative Screening Summary
- 7.0 DEVELOPMENT OF REMEDIAL ALTERNATIVES FOR SITE 2
 - 7.1 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES
 - 7.2 DEVELOPMENT OF REMEDIAL ALTERNATIVES
 - 7.3 SCREENING OF REMEDIAL ALTERNATIVES
 - 7.3.1 Alternative 1
 - 7.3.2 Alternative 2, etc.
 - 7.3.i Alternative Screening Summary
- 8.0 DETAILED ANALYSIS OF ALTERNATIVES FOR SITE 1
 - 8.1 NO ACTION
 - 8.1.1 Description
 - 8.1.2 Technical Criteria Assessment
 - 8.2 ALTERNATIVE 1
 - 8.2.1 Description
 - 8.2.2 Technical Criteria Assessment
 - 8.3 ALTERNATIVE 2, ETC.
 - 8.3.1 Description
 - 8.3.2 Technical Criteria Assessment
 - 8.i COMPARATIVE ANALYSIS OF ALTERNATIVES
- 9.0 DETAILED ANALYSIS OF ALTERNATIVES FOR SITE 2
 - 9.1 NO ACTION
 - 9.1.1 Description
 - 9.1.2 Technical Criteria Assessment
 - 9.2 ALTERNATIVE 1
 - 9.2.1 Description
 - 9.2.2 Technical Criteria Assessment
 - 9.3 ALTERNATIVE 2, ETC.
 - 9.3.1 Description
 - 9.3.2 Technical Criteria Assessment
 - 9.i COMPARATIVE ANALYSIS OF ALTERNATIVES

- revisions to and production of the Draft FS report must be made within 35 days of receipt of comments from Navy and the subtask is authorized to start;
- receipt of additional comments after start of the subtask will require evaluation of resources (LOE) and schedule compliance and will be the basis for cost growth and schedule exclusion; and
- a response to comments will be provided to the Navy within 25 days of authorization to begin the subtask.

The Navy will provide Points of Contacts and addresses for all addressees.

Final Draft FS Report After the Draft FS Report is prepared and submitted, the regulatory agencies will review the document and present the Navy with any comments. Upon receipt of comments and authorization to begin this subtask from the Navy, ABB-ES will prepare a response to comments letter within 25 days. After the response to comments are prepared, a comment review meeting will be scheduled with the NRPM and appropriate facility personnel in Tallahassee, Florida. The purpose of the comment review meeting is to discuss the FS report and clarify all responses to regulatory agency comments to the Navy RPM prior to the TRC meeting. The TOM, FS Leader, and FS Engineers will be present at this meeting to discuss site conditions and data analysis findings with the Navy. ABB-ES will also prepare a meeting summary and strategy paper for the Navy under this subtask.

After authorization to start from the Navy, the Final Draft FS report for OU 1 will be prepared. The LOE for this task is based on the assumptions outlined above. The Navy will provide Points of Contact and addresses for all addressees. The LOE for this subtask was developed based on experience in finalizing other FS reports.

Finalization of FS Report for OU 1 According to the FFA, the Final Draft FS report must be distributed to all involved parties. If after 30 days, no party has disputed the conclusions of the FS report, the Final FS report will be produced.

Subtask 16.2, Feasibility Study for OU 2 ABB-ES will prepare an FS for OU 2 in accordance with Subsection 5.3.2 of SOW No. 77 dated February 1, 1993, and consistent with activities outlined under Section 16.0.

OU 2 consists of four PSCs: Site 3, Oil and Sludge Disposal Area; Site 4, Kitchen Grease Disposal Area; Site 5, Oil Disposal Area Northwest; and Site 17, Oil and Sludge Disposal Area Southwest. Site 4 is currently undergoing screening investigation to collect information for the parties to the FFA to use in evaluating whether it should be included in RI/FS activities or if no further action (NFA) is appropriate. The LOE presented in Subtask 13.2 assumes that sufficient information was collected during the supplemental sampling for PSC 4 to complete an RI. The LOE presented in this subtask assumes that sufficient information was collected and presented in the RI to complete an FS for PSC 4. Tasks involved in the production of this report, similar to Subtask 16.1, are: implementation of the feasibility study; production, distribution, and review of Navy Draft report and Draft report; review of Draft report, preparation of response to comments, and production and distribution of the Final Draft report; and finalization of the FS report for OU 2.

Feasibility Study for OU 2 ABB-ES will complete a feasibility study for OU 2 at NASCF. The RI report will be used to provide data sufficient to define the nature and extent of contamination, identify target clean-up levels, identify remedial action objectives, identify and screen appropriate technologies and alternatives, and review ARARs for this OU.

Upon completion of the supplemental sampling and analysis at OU 2, the FS for OU 2 will be implemented. Activities that will be conducted for OU 2, similar to Subtask 16.1, are as follows.

- A compilation, analysis, and qualitative summary of the nature and extent of contamination and the risk assessment will be revised and completed for the RI under Tasks 12 and 13.
- A meeting will be held in the ABB-ES Tallahassee, Florida, office to discuss the identification of remedial action objectives and target cleanup levels for OU 2. The following personnel will be involved: NRPM, TOM, FS Leader, FS Engineers (2), RI Leader, Human Health Risk Assessment Leader, Ecological Risk Assessment Leader, and the FS Technical Expert;
- Remedial technologies will be identified and screened based on cost, implementability, and effectiveness.
- Remedial alternatives for each site within OU 2 will be developed and screened. It is anticipated that approximately six alternatives (three for addressing soil contamination and three for addressing groundwater contamination) will be evaluated for each site within OU 2. In addition, it is anticipated that three additional alternatives will be developed for Site 5 in order to address free product at the site. This is a total of 27 alternatives for OU 2.
- A detailed analysis (based on nine criteria presented in Exhibit 2) of alternatives that pass the screening phase will be developed. This analysis includes a cost estimate and a sensitivity analysis of cost, quantities, and residual risk. As discussed previously, it is anticipated that a total of 27 alternatives will undergo detailed analysis for OU 2.
- A comparative analysis of all alternatives will be included in order to compare remedial action alternatives with each other based on the nine criteria.
- A meeting will be held in the ABB-ES Tallahassee, Florida, office to orally present the conclusions of the feasibility study. The following personnel will be involved: NRPM, TOM, FS Leader, and FS Engineers (2).

The LOE and the associated justification for Subtask 16.2 were based on previous experience in preparing FSs at other private and Federal sites. Any additional field work necessitated by Navy review is not anticipated and, thus, is not included in the scope of this effort.

Draft FS Report for OU 2 For this task, ABB-ES will complete the Navy Draft FS report for OU 2 at NASCF. Tasks involved in the development of an FS were presented in Exhibit 1 and an outline of a typical FS report is included in Exhibit 3. A Navy Draft FS report, following the guidelines of Exhibit 3, will be prepared for submittal to the NRPM and NASCF within 4 weeks of initiation of this subtask.

After the Navy Draft FS report is prepared and delivered to the Navy, a review meeting will be scheduled with the NRPM and appropriate facility personnel in Tallahassee, Florida. The purpose of the document review meeting is to discuss the Navy Draft FS report with the Navy, allow discussion of its contents with cognizant professional staff and the Navy, and to gather timely Navy comments to be included in the Draft FS report. The TOM, FS Leader, and FS Engineers will be present at this meeting to discuss site conditions and data analysis findings with the Navy. The LOE for this effort assumes that the comments during the document review meeting from the Navy are consistent with previous project scope, strategy, and direction, and that substantial changes to the format and content of the Navy Draft FS report are not required.

After receipt of the Navy's comments on the Navy Draft FS report, a Draft FS report will be prepared in response to Navy comments and the strategy developed with the Navy. Copies of the Draft FS report will be submitted to applicable addressees. The LOE for this subtask was based on the assumptions outlined in Subtask 16.1. The Navy will provide Points of Contacts and addresses for all addressees.

Final Draft FS Report for OU 2 After the Draft FS report is prepared and submitted, the regulatory agencies will review the document and present the Navy with any comments. Upon receipt of comments and authorization to begin this subtask from the Navy, ABB-ES will prepare a response to comments letter within 25 days. After the response to comments are prepared, a comment review meeting will be scheduled with the NRPM and appropriate facility personnel in Tallahassee, Florida. The purpose of the comment review meeting is to discuss the FS report and clarify all responses to regulatory agency comments to the NRPM prior to the TRC meeting. The TOM, FS Leader, and FS Engineer(s) will be present at this meeting to discuss site conditions and data analysis findings with the Navy. ABB-ES will also prepare a meeting summary and strategy paper for the Navy under this subtask.

After authorization to start from the Navy, the Final Draft FS report will be prepared. The LOE for this task is based on the assumptions outlined in Subtask 16.1. The Navy will provide Points of Contact and addresses for all addressees. The LOE for this subtask was developed based on experience in finalizing other FS reports.

Finalization of FS Report for OU 2 According to the FFA, the Final Draft FS report must be distributed to all involved parties. If after 30 days no party has disputed the conclusions of the FS report, the Final FS report will be produced.

Subtask 16.3, Feasibility Study for OU 7 ABB-ES will prepare an FS for OU 7 in accordance with Subsection 5.3.3 of SOW No. 77 dated February 1, 1993, and consistent with activities outlined under Section 16.0.

OU 7 consists of one PSC: Site 16, AIMD Seepage Pit and Adjacent Area. Tasks involved in the production of this report, similar to Subtask 16.1, are: implementation of the Feasibility Study; production, distribution, and review of Navy Draft and Draft reports; review of draft report, preparation of response to comments, and production and distribution of the Final Draft report; and finalization of the FS report for OU 2.

Feasibility Study for OU 7 ABB-ES will complete a feasibility study for OU 7 at NASCF. The RI report will be used to provide data sufficient to address all components of the FS as outlined in the introduction to Section 16.0.

Upon completion of the supplemental sampling and analysis at OU 7, the FS for OU 7 will be implemented. Activities that will be conducted for OU 7, similar to those activities that will be completed for OU 2, are as follows:

- A compilation, analysis, and qualitative summary of the nature and extent of contamination and the risk assessment will be revised and completed for the RI under Tasks 12 and 13.
- A meeting will be held in the ABB-ES Tallahassee, Florida, office to discuss the identification of remedial action objectives and target clean-up levels for OU 7. The following personnel will be involved: NRPM, TOM, FS Leader, FS Engineers (2), RI Leader, Human Health Risk Assessment Leader, Ecological Risk Assessment Leader, and the FS Technical Expert.
- Remedial technologies will be identified and screened based on cost, implementability, and effectiveness.
- Remedial alternatives for OU 7 will be developed and screened. It is anticipated that approximately six alternatives (three for addressing soil contamination and three for addressing groundwater contamination) will be evaluated.
- A detailed analysis (based on nine criteria presented in Exhibit 2) of alternatives that pass the screening phase will be developed. This analysis includes a cost estimate and a sensitivity analysis of cost, quantities, and residual risk. As discussed previously, it is anticipated that a total of six alternatives will undergo detailed analysis for OU 7.
- A comparative analysis of all alternatives will be included in order to compare remedial action alternatives with each other based on the nine criteria.
- A meeting will be held in the ABB-ES Tallahassee, Florida, office to orally present the conclusions of the Feasibility Study. The following personnel will be involved: NRPM, TOM, FS Leader, and FS Engineers (2).

The LOE and the associated justification for Subtask 16.3 were based on previous experience in preparing FSs at other private and Federal sites. Any additional field work necessitated by Navy review is not anticipated and, thus, is not included in the scope of this effort.

Draft FS Report for OU 7 Once the conclusions of the FS are agreed upon by the Navy and ABB-ES, ABB-ES will complete the Navy Draft and Draft FS reports for OU 7 at NASCF. Tasks involved in the development of an FS were presented in Exhibit 1 and an outline of a typical FS report is included in Exhibit 3. A Navy Draft FS report, following the guidelines of Exhibit 3, will be prepared for submittal to the Navy RPM and NASCF.

After the Navy Draft FS report is prepared and delivered to the Navy, a review meeting will be scheduled with the NRPM and appropriate facility personnel in Tallahassee, Florida. The purpose of the document review meeting is to discuss the Navy Draft FS report with the Navy, allow discussion of its contents with cognizant professional staff and the Navy, and to gather timely Navy comments to be included in the Draft FS report. The TOM, FS Leader, and FS Engineers will be present at this meeting to discuss site conditions and data analysis findings with the Navy. The LOE for this effort assumes that the

comments during the document review meeting from the Navy are consistent with previous project scope, strategy, and direction, and that substantial changes to the format and content of the Navy Draft FS report are not required.

After receipt of the Navy's comments on the Navy Draft FS report, a Draft FS report will be prepared in response to Navy comments and the strategy developed with the Navy. Copies of the Draft FS report will be submitted to applicable addressees. The Navy will be timely and will not impact the production efforts of the Draft FS report. The LOE for this subtask was based on the assumptions outlined in Subtask 16.1. The Navy will provide Points of Contacts and addresses for all addressees.

Final Draft FS Report for OU 7 After the Draft FS report is prepared and submitted, the regulatory agencies will review the document and present the Navy with any comments. Upon receipt of comments and authorization to begin this subtask from the Navy, ABB-ES will prepare a response to comments letter within 25 days. After the response to comments are prepared, a comment review meeting will be scheduled with the NRPM and appropriate facility personnel in Tallahassee, Florida. The purpose of the comment review meeting is to discuss the FS report and clarify all responses to regulatory agency comments to the NRPM prior to the TRC meeting. The TOM, FS Leader and FS Engineer(s) will be present at this meeting to discuss site conditions and data analysis findings with the Navy. ABB-ES will also prepare a meeting summary and strategy paper for the Navy under this subtask.

After authorization to start from the Navy, the Final Draft FS report will be prepared. The LOE for this task is based on the assumptions outlined in Subtask 16.1. The Navy will provide Points of Contact and addresses for all addressees. The LOE for this subtask was developed based on experience in finalizing other FS reports.

Finalization of FS Report for OU 7 According to the FFA, the Final Draft FS report must be distributed to all involved parties. If after 30 days no party has disputed the conclusions of the FS report, the Final FS report will be produced.

TASK 17, INTERIM REMOVAL ACTION PLAN, POTENTIAL SOURCE OF CONTAMINATION (PSC) 11. SOW 77 (Section 10.1, Task 19) indicates that an Interim Removal Action Plan should be developed to address the removal of drums and 5-gallon containers that were buried at PSC 11, the Golf Course Pesticide Disposal Area. Task 17 provides a description of the Removal Action Plan and outlines the steps that must be followed for preparing such a plan. A Removal Action Plan consists of four separate parts: (1) Focused Feasibility Study (FFS), (2) A Proposed Plan (PP), (3) a Responsiveness Summary, and (4) an Interim Record of Decision (IROD). Guidance for preparing the above documents has been provided by the USEPA.

In accordance with the SOW reporting schedule, it is assumed that the Navy is the lead agency responsible for coordinating public comments and that the reports developed under this task are not considered primary documents subject to dispute resolution of the FFA.

The Removal Action Plan requested in Task 19 of the SOW will conform to the outlines provided in the USEPA guidance documents. The following subtasks discuss the steps that will be followed.

Subtask 17.1, Conduct a Focused Feasibility Study (FFS) The FFS identifies and evaluates a limited number of potential removal alternatives and develops estimated implementation costs for the alternatives. The rationale and basis for selecting a specific removal action is established during the FFS process. Exhibit 4 provides the content of the FFS report and also serves as a breakdown for the following

EXHIBIT 4
FOCUSED FEASIBILITY STUDY OUTLINE

- 1.0 INTRODUCTION
 - 1.1 THE CERCLA PROCESS
 - 1.2 PURPOSE AND SCOPE OF THE FFS
 - 1.3 SITE 11, SITE DESCRIPTION AND HISTORY
- 2.0 IDENTIFICATION OF REMEDIAL ACTION OBJECTIVES
 - 2.1 ARARs
 - 2.1.1 Definition of ARARs
 - 2.1.2 Location-Specific ARARs
 - 2.1.3 Chemical-Specific ARARs
 - 2.2 REMEDIAL RESPONSE OBJECTIVES
- 3.0 ALTERNATIVES FOR SITE 11
 - 3.1 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES
 - 3.2 DEVELOPMENT OF ALTERNATIVES
 - 3.2.1 No Action
 - 3.2.2 Excavation, On-site Treatment
 - 3.2.3 Etc.
 - 3.3 ACTION-SPECIFIC ARARs
- 4.0 DETAILED ANALYSIS OF ALTERNATIVES
 - 4.1 NO ACTION
 - 4.2 EXCAVATION, ON-SITE TREATMENT
 - 4.3 Etc.
- 5.0 ALTERNATIVES SUMMARY AND COMPARISON
 - 5.1 SUMMARY OF DEVELOPED ALTERNATIVES
 - 5.2 COMPARATIVE ANALYSIS OF ALTERNATIVES

subtasks. To support this task, a kick-off meeting was held with the key project team members, regulators, and the Navy at NASCF. Preliminary field work will be preformed prior to the initiation of the FFS. The field work will included site clearing and a geophysics survey.

Introduction This subtask will present in summary format the use of FFS in the CERCLA process, the purpose and scope of the FFS, and site characterization information including:

- a. a description of the site's physical setting, the area topography, uses of adjacent land, location of and distance to nearby populations, general surface and groundwater resources, and an estimate of the volume of debris and drums at the site;
- b. a site history including a summary of previous investigation activities;
- c. identification of all known or suspected sources of contamination at the site and the media affected; and
- d. a brief contamination assessment and risk evaluation will be included to provide the justification for undertaking a removal action at this site.

The contamination assessment will estimate the volume and concentration of contaminants and evaluate the potential for toxicity, mobility, and carcinogenicity of the contaminants. As part of the risk evaluation the potential targets and migration pathways will be identified and evaluated. Additionally, because a question remains as to the exact boundaries of the burial pits, a geophysical survey will be completed in an effort to further define the location of buried materials at PSC 11.

Identification of Remedial Action Objectives This section of the FFS report requires that a determination must be made as to the purpose and scope of any proposed removal alternative (e.g., will only the drums and crushed containers be removed or should contaminated soils also be excavated and removed as part of the removal action). The scope of the removal action will be determined, to a large extent, through the identification of the principal threats that must be addressed. Associated with the threats, identification of ARARs may impact the types of removal alternatives that will be considered. Both chemical-specific and location-specific ARARs will be identified as part of this task. USEPA guidance indicates that removal actions should meet ARARs to the extent practicable. Additionally, the ARARs database will be employed when selecting the removal alternative that best meets the objective for the site.

Finally in this section, a general project schedule will be developed. The schedule will incorporate time, regulatory, and operational constraints. The actual schedule for the removal action will be proposed as part of the development of engineering plans and specifications (Subtask 17.4 below); however, identified constraints must be considered when evaluating the removal alternatives.

Identification of Removal Action Alternatives As part of this subtask, screening of a limited number of alternatives will be conducted to identify those that would be appropriate for use in a removal action at Site 11. As part of this screening process, consideration will be given to:

- specific methodology (technology) employed,
- equipment required (type and amount),
- personnel required (number and training),

- availability of services (e.g., hazardous waste incineration) in the region, and
- byproducts generated by the alternatives.

Upon completion of the screening process, one to three appropriate alternatives will be selected for further detailed evaluation and consideration. The alternatives selected will be consistent with the objectives identified in Subtask 13.1.

Detailed Analysis of Removal Alternatives A limited number of alternatives will be identified as potentially feasible and will be evaluated individually based on their effectiveness, implementability, and projected cost. The effectiveness criteria considers such factors as:

- how protective is it of the surrounding population and onsite workers,
- to what extent does the alternative reduce or mitigate the identified threats,
- how well does it meet the objectives that will be identified as part of Subtask 13.1,
- how well does it comply with the ARARs, and
- does the alternative create potential adverse environmental impacts.

The implementability criteria evaluates how difficult it is to undertake the alternative and what is the likelihood of public and regulatory acceptance. Also, as part of this subtask, action-specific ARARs will be identified as appropriate and the alternative will be evaluated on how it complies with these ARARs. In addition, if there are physical or environmental constraints that impact the use of the alternative, these will be considered during this evaluation.

The final criteria that will be used in the analysis is the projected cost for implementing the alternative. Because costs can have such a major impact on any program, it is important to spend the effort to develop cost ranges that will be reflective of those anticipated during actual implementation. Thus, a conceptual design (30 percent design) may be completed for each alternative evaluated to effectively compare costs between alternatives. Detailed cost estimates will only be completed for the removal action alternative finally selected for Site 11.

Comparative Analysis And Selection of Alternative Qualitative assessment of strengths and weaknesses will be used for comparing the appropriate removal action alternatives. The final step in the FFS process would be the selection of the proposed removal action. This would be based on the comparison made between alternatives as described in Subtask 17.1. Because the public has the opportunity to review and comment on the selection, a decision tree will be developed that summarizes the findings from the analysis of alternatives. This should more clearly depict why a certain alternative was selected over the other(s).

Draft FFS Report Development A FFS report will be prepared that summarizes and documents the steps taken in selecting the proposed removal action alternative. This report will follow the outline shown on Exhibit 4. The report will be prepared in draft form (90 percent draft) for initial submittal for Navy review. After review by the Navy and response to their comments, a Final Draft FFS report will be submitted to the Navy and those agencies and persons identified in SOW 77 under Task 19. Based on the information provided, we have budgeted for 30 copies of the Final Draft to be distributed.

Final FFS Report Development After receipt of the regulatory comments, the Final FFS report will be prepared and released for public review and comment (as required under the USEPA Guidance). The LOE assumes that all agency comments will be timely and will not impact the production of the Final FFS report. In addition to those for the public, copies of the Final FFS report will be submitted to those identified under Task 19 in SOW No. 77. We have budgeted for the distribution of 30 copies of the Final FFS report.

Proposed Plan ABB-ES will prepare a PP in the fact sheet format. Chapters 2, 3, and 9 of the *Interim Final Guidance on Preparing Superfund Decision Documents* (OSWER Directive 9335.3-02, November 1989, EPA/540/6-89/007) will be used as a guidance. Section 117(a) of the CERCLA of 1980, as amended by the SARA of 1986 requires preparation of PPs as part of the site remediation process. The PP will be prepared after the FFS is completed and will be made available with the FFS to the public for comments. The PP highlights key aspects to the FFS, provides a brief analysis of remedial alternatives under consideration, identifies the preferred alternative, and provides members of the public with information on how they can participate in the remedy selection process. A notice and brief analysis of the PP will be published in a major local newspaper of general circulation. In addition, the PP, the FFS, and the other contents of the Administrative Record will be made available to the information repository near the site.

Subtask 17.2, Responsiveness Summary As indicated above, the FFS must be made available for public review and comment. Available guidance specifies that the review and comment period should be 30 days after which a responsiveness summary is prepared. The Responsiveness Summary is a written response to significant comments made by the public. This written response becomes an attachment to the FFS, which in turn is an attachment to the IROD. A Draft Responsiveness Summary will be prepared and submitted to the Navy for review and comment. Following response to Navy comments, a Final Responsiveness Summary will be prepared and submitted to the regulatory agencies. Thirty (30) copies of the Responsiveness Summary have been budgeted for distribution.

Subtask 17.3, Develop An Interim Record of Decision (IROD) The IROD provides a concise written record of the decision process used in selecting a remedial action. It describes the site's history, current activities, the health and environmental threats, and outlines the proposed actions and costs. Specifically, the IROD documents the need for the removal action, demonstrates that it was done in accordance with CERCLA requirements, and substantiates that it is not inconsistent with the National Oil and Hazardous Substances Contingency Plan (NCP). As such, the IROD serves as the primary decision document for a removal process and becomes a significant part of the Administrative Record for a site or a facility. Under CERCLA, the IROD must be submitted and accepted by all parties, before the initiation of any onsite removal activity.

Prepare Draft IROD The USEPA Guidance provides a recommended outline, which will be followed when preparing the IROD. Exhibit 5 presents the recommended outline as shown in the OSWER publication number 9355.3-02FS-3, March 1991. An IROD will be prepared in draft form for submittal to the Navy for review and comment. Upon receipt of the Navy's comments, a Draft IROD will be completed and submitted to the regulatory agencies for their review and comment. Because the IROD reflects the information presented in the FFS, it is not anticipated that the regulatory agencies will have significant technical questions or comments on the Draft IROD. The only time when the IROD might differ from the FFS would be as a result of comments from the public. Thus, the IROD will reference the FFS and Responsiveness Summary where applicable. Thirty (30) copies of the Draft IROD have been budgeted for distribution.

EXHIBIT 5
INTERIM ACTION RECORD OF DECISION (ROD) FORMAT

1. Declaration

Site Name and Location

Statement of Basis and Purpose

Assessment of the Site

Description of Selected Remedy

Statutory Determination

Signature and Support Agency Remedy Acceptance

2. Decision Summary

Site Name, Location, and Description

Site History and Enforcement Activities

Highlights of Community Participation

Scope and Role of Operable Unit

Site Characteristics

Summary of Site Risks

Description of Alternatives

Summary of Comparative Analysis of Alternatives

Selected Remedy

Statutory Determination

Explanation of Significant Changes

3. Responsiveness Summary

Prepare Final IROD After receipt of comments from the regulatory agencies, a Final IROD will be prepared. The LOE assumes that the comments will be presented in a timely manner and will not require significant changes from the Draft IROD. Thirty (30) copies of the Final IROD will be prepared for distribution as indicated in the SOW.

Subtask 17.4, Plans and Specifications for Removal Action at PSC 11 Using the conceptual design developed under the FFS as a basis for design, ABB-ES will prepare plans and specifications for the removal action at PSC 11. Under this subtask requested in Section 10.2, Task 20 of the SOW, ABB-ES will develop the following documents in support of the Site 11 removal action bid documents:

- removal action plans and specifications,
- detailed cost estimate, and
- generic removal action schedule.

These documents will be prepared in accordance with the following standards:

NEESA 20.2-062 *Remedial Action Contracts Delivery Order Requirements Package Guide*, Parts 1 and 2, August 1992;

DOD MIL-HDBK-1006/1, *Policy and Procedures for Project Drawing and Specification Preparation*, August 1987;

SOUTHNAVFACENGCOM P-141, *Guide for Architect-Engineer Firms Performing Services for the Southern Division, Naval Facilities Engineering Command*, June 1989; and

NAVFACENGCOM MO-327, *Facility Support Contract Quality Management Manual*, June 1989.

Submittals associated with this task include a 100 percent, and final submission of the removal action plans and specifications, detailed cost estimate, and generic removal action schedule. To meet the deliverable dates of these documents, it is assumed there will be no significant change in the removal action identified during the initial draft of the FFS that will cause redesign of the removal action identified in the Final IROD.

The design team will be led by the ABB-ES Tallahassee office and supported by our Washington, D.C., office. ABB-ES will conduct two project team meetings during the preparation of the above-specified plans and specification documents, one in Tallahassee and one in Washington, D.C. These meetings will support quality, coordination, and interaction of the multiple design documents. The following text provides detailed information of all subtasks required to meet SOW requirements.

Plans and Specifications Preparation of detailed specifications for the removal action will consist of the following elements.

1. **Detailed Work Breakdown Structure and Tree Diagram.** Development of a WBS and tree diagram requires the identification of all key functions and their relationships that are to be undertaken as part of the removal action. As required by NEESA 20.2-062 (August 1992), the WBS will be presented to the third and fourth level of the hazardous, toxic, and radiological waste (HTRW) work breakdown structure. The breakdown of the remediation contract elements into divisions and subdivisions supports thorough identification of required Construction

Specifications Institute (CSI) specifications and cost estimate preparation. Tree diagramming of the WBS facilitates accurate scheduling of the removal action by establishing key relationships and parallel or serial sequencing considerations.

2. Specification Development. Specifications will be prepared using CSI format. The specifications package will be comprised of performance, functional, and design specifications or combinations as required to adequately define project requirements. The specifications will be prepared in accordance with the cited references. SOUTHNAVFACENGCOM will furnish ABB-ES with a hard copy of the NAVFAC Guide Specifications. A preliminary list of specifications appropriate for the removal action are provided below.

SECTION I TECHNICAL SPECIFICATIONS

Division 1 General Requirements

01010	Removal Action Summary of Work
01030	Special Project Procedures
01060	Regulatory Requirements
01150	Measurement and Payment
01400	Contractor Quality Control System
01410	Sampling and Analysis
01510	Temporary Facilities
01560	Environmental Protection
01720	Project Record Documents

Division 2 Site Work

02010	Mobilization and Demobilization
02081	Offsite Transportation
02082	Offsite Disposal
02100	Site Preparation
02110	Site Maintenance
02205	Waste Excavation
02220	Site Restoration

SECTION II DESIGN SKETCHES

Appendix A	Site Characterization Data
	Site Geotechnical Data

3. Design Drawings. Design drawings or plans will be incorporated into the plans and specification package to document existing site conditions and to establish specific requirements of the removal action. These drawings will include existing and proposed site contours, general construction notes, and construction details. All drawings shall be on "D" size (i.e., 22 inches by 34 inches) sheets and prepared in accordance with the Department of Defense (DOD) MIL-HDBK-1006/1 (August 1987). The drawings will present: the contractors access to the site; limits of work (LOW); existing conditions, structures, and utilities; as well as pre- and post-remediation site

conditions. Both plan and profile views will be presented on the construction plans. The following drawings will be included in the Plans and Specifications Package.

<u>Title</u>	<u>Estimated No. of Sheets</u>
Cover Page (w/index and legend)	1
Existing Conditions	1
Site Map with Access Routes and Delineation of Excavation Zones	2
Detail of Utilities in Vicinity of Excavation Zones	1
Excavation and Grading Plan	1
Construction Details	2
Total	<u>8</u>

The design drawings will be prepared using AutoCAD™ Version 11. SOUTHNAVFACENGCOM will provide ABB-ES with the Remedial Action Contract (RAC) number and the drawing numbers prior to the submittal of these drawings.

Detailed Cost Estimate Construction cost estimates will be prepared following the HTRW Remedial Action WBS. The cost estimates will be prepared in narrative format to identify assumptions, equipment, and material quantity calculations. Additionally, the cost estimates will be presented in tabular summary format following the WBS with itemized labor, equipment, and material costs.

Generic Schedule Using the WBS and tree diagram described in above, generic schedule for the removal action will be produced to support the remediation contracting effort. The construction schedule will be prepared based on the third level of the WBS. The time-based schedule will present the sequence for the remedial construction activities and will provide for upfront procurement and regulatory issues as well as incorporate appropriate regional weather delay data.

TASK 18, OU 7, PSC 16 INTERIM REMOVAL ACTION. SOW 77 (Section 8.5, Task 12) indicates that an Interim Removal Action Plan, plans and specifications, and RCRA permit regulatory support shall be provided to address the removal of the RCRA holding tank, the seepage pit, and the bead separator at Site 16, the AIMD Seepage Pit.

The Removal Action Plan, plans and specifications, cost estimate, and generic schedule will be developed as outlined in Subtasks 17.1 through 17.4 above. Along with these tasks, ABB-ES will attend up to three regulatory meetings to address RCRA issues and provide up to four letter reports when requested by the EIC.

TASK 19, FACILITY ECOLOGICAL ASSESSMENT WORKPLAN. In accordance with Task 18 of the SOW, ABB-ES will develop a comprehensive facility ecological assessment workplan. The plan will provide for the assessment of potential risks to both terrestrial and aquatic receptors resulting from the release of contaminants from the IR program PSCs and/or other sources that have a bearing on the interpretation and assignment of risks. The facility assessment shall address concerns raised by the Natural Resource Trustees.

Subtask 19.1, Develop Facility Ecological Assessment Approach ABB-ES will develop the approach to assessment of ecological risks for the facility and the format for the draft interim report as Subtask 19.1. The approach will be developed by ABB-ES Senior Ecologists in consultation with a Technical Expert and the TOM.

Subtask 19.2, Prepare Draft Workplan The Draft Workplan will specify the steps for implementation and reporting for the facility ecological assessment. The workplan will specify any investigation or analyses needed to complete the facility assessment and timeframes for completion of the project.

An ABB-ES Ecologist and Scientist will require 4 weeks each to draft the workplan. The ABB-ES Senior Ecologist will have the Draft Workplan reviewed by a Technical Expert and another Senior Ecologist. The Draft Workplan will be written with the assistance of the TOM, toxicologist, Quality Assurance Manager, Engineer, and CAD Draftsperson. The Senior Ecologist will require 16 hours to review the document and the Technical Expert will require 8 hours. Review and incorporation of review comments will require 3 days or 24 hours for a Senior Ecologist.

Production and distribution of the Draft Workplan will require 2 days for a Scientist and Word Processor. The Draft Workplan will be submitted for regulatory review in accordance with the schedule in Appendix C. The following copies of the Draft Workplan will be distributed:

SOUTHNAVFACENGCOM	3
NASCF (Code 20IR)	4
NASCF Forester	2
Region IV USEPA	2
FDER	2
NRT (each)	1

Subtask 19.3, Respond to Comments ABB-ES will respond to agency comments on the Draft Workplan and will issue a letter in response. The response will specify how the comments will be incorporated into the approach for the facility ecological assessment. The LOE assumes that a final workplan will not be redistributed to the agencies and that the response letter will be sufficient to explain any changes to the approach. The comments received will be considered in Subtask 19.4 for the Draft Facility Assessment Report.

The LOE assumes that 3 days will be required of an ABB-ES Senior Ecologist to review the comments received and to issue a response letter.

Subtask 19.4, Prepare Final Workplan and Draft Assessment Report The Draft Facility Assessment Report will include any initial elements developed during the workplan. These elements may include: introduction, purpose and scope, definition of ecological risk assessment, facility ecosystem, problem formulation, and conceptual model.

TASK 20, COMMUNITY RELATIONS The purpose of this task is to provide proactive support to the Navy Public Affairs Officer (PAO) through the following subtask activities:

- administrative record and information repository,
- mailing list,
- press releases,
- availability session,

- fact sheets,
- speaker program, and
- proactive community relations.

These activities are intended to facilitate and enhance the community's awareness, understanding, and access to IR program activities at NASCF.

Administrative Record and Information Repository The Navy has contracted with ENSAFE to provide all Administrative Record tasks at NAS Cecil Field. Therefore, ABB-ES has zero LOE for this subtask.

Mailing List The community relations (CR) specialist will develop a mailing list by compiling names and addresses obtained from the activity PAO and the Installation Restoration Coordinator (IRC). The list will be developed in WordPerfect™ 5.1 and will be ready for printing on peel-off labels. The disk will be provided to the activity point of contact for distribution of public information. The CR specialist will update and provide the list to the point of contact on disk or on pre-printed labels, as they prefer, quarterly thereafter.

Press Releases The CR specialist will draft one press release early in the RI, which will provide:

- a brief program overview,
- a description of RI activities,
- an announcement of the availability session,
- the location of the Information Repository,
- an invitation to join the mailing list, and
- the program point of contact.

The CR specialist will also draft one additional press release or public notice during the RI to report progress in the program or to address special topics of public interest. Each draft will be reviewed by the activity point of contact and the NRPM. The CR specialist will revise each draft within 3 days of receipt of the Navy's comments. Each release will be revised a second time to include comments from regulatory review. Final releases will be provided to the point of contact for distribution, the NRPM, and the library for inclusion in the Information Repository.

Availability Session The CR specialist will provide guidance and support to activity personnel and the NRPM as they plan and host an availability session. The purpose of the session will be to provide the public with an informal setting to receive IR program information and talk with program staff and regulatory representatives. The CR specialist will prepare a fact sheet for distribution at the session.

Fact Sheets The CR specialist will draft two fact sheets during the RI; one explaining the RI process and one outlining findings later in the program. Each sheet will be one to four pages in length, consisting of text and illustrative graphics. Each sheet will be reviewed by NASCF and the NRPM. The CR specialist will revise each sheet within 10 days of receipt of the Navy's comments. Each sheet will be revised a second time, when necessary, to include comments from regulatory review. Three hundred and forty copies of each sheet will be printed on 24-pound, gray paper stock. Fact sheets will be shipped via courier service; 300 to the point of contact for mailing list distribution and 20 to the NRPM. ABB-ES will also maintain the master and 20 extra copies for backup and reference.

Speaker Program The CR specialist will assist the activity in developing presentation materials for their Speaker Program. The presentation will include up to 50 overhead transparencies, with a master hardcopy set from which handouts can be reproduced for customized presentations over time.

Proactive Community Relations The CR specialist will develop a proactive strategy to implement the Final Community Relations Plan. The strategy will include:

- a monthly schedule of activities to be conducted in 1993-94;
- roles and responsibilities for implementing each activity;
- review procedures and timeframes for producing fact sheets, press releases, and other publications; and
- methodology for communicating Dispute Resolution issues to the public.

The strategy will require expeditious review and concurrence by the NRPM, the Southern Division PAO, activity leadership and program personnel, and the point of contact prior to its implementation. The Dispute Resolution section will also require approval by Southern Division and NASCF legal counsel.

In order to keep abreast of developments in the NASCF program and the community, the CR specialist will solicit regular updates from the ABB-ES Project Manager and the activity PAO, and will subscribe annually to the Florida Times Union.

PROJECT PERSONNEL AND ORGANIZATIONAL CHART

Successful execution of this CTO will depend on Key Project team members to support the various elements of work to be executed. As previously discussed with the NRPM and as presented under Task 1, Section 5.12, Project Management Plan, a PET will be assigned to execute work at NASCF. The organizational chart presented in Figure 1 identifies the Key Project members and PET members. A short description of ABB-ES personnel roles and responsibilities follows.

Task Order Manager. Barry Lester, P.E., will serve as TOM for this project. The TOM will have authority and responsibility for the overall performance. The TOM will maintain liaison with responsible Navy representatives to ensure that priorities remain current and task order status is available. All task work will follow existing program documentation and QA standards and procedures. The TOM will be responsible for coordination of project personnel, internal reviews, and will evaluate deliverables prior to delivery to the Navy.

Quality Review Board. The Quality Review Board is considered an important intricate part of ABB-ES' total approach to doing business. This Quality Review Board is composed of Willard Murray, Overall Technical Director for the CLEAN Program; Marland Dulaney, Senior Risk Assessment reviewer; Geoff Shallard, Senior Engineer, who will support design efforts; Wayne Britton, a Certified Soil Scientist, who will support review of the Remedial Investigation; and Ben Greene, QA Manager. The Quality Review Board provides many years of experience that will facilitate the RI and FS activities and will be integrated into the review process and provide for senior review of documents and deliverables while working closely with the Technical Director and other team members as required.

Technical Lead. Dirk Brunner, P.E., will serve as the Technical Lead for the NASCF project. He will be responsible for identification and oversight of the program objectives and will work closely with other Project Team members during execution of the project.

Remedial Investigation. The Remedial Investigation Leader is Charlie Donahue. He has been involved with the site investigations since the beginning of the CLEAN field program at NASCF. Mr. Donahue will be responsible for RI activities to ensure the field program and associated reports meet the objectives of the RI program. Additionally, Mr. Donahue will be responsible for review of analytical data and data validation. He will be supported by Maria Pijnenburg and Andrew Lonergan in developing the Remedial Investigation Report.

Field Operations. Maria Pijnenburg, P.G., will serve as the Field Operations Leader for operations on NASCF. She will provide the day-to-day field management and oversee all field operations including drilling, soil gas efforts, and other field technology as applicable.

Risk Assessment. Risk Assessment efforts for this program will be provided by Michelle Silkowski and Janet Burris. Ms. Silkowski will be responsible for evaluating Human Health Risk, and Ms. Burris will be responsible for evaluating Ecological Risk. Together, they will be responsible for preparation of the Risk Assessment Report.

Feasibility Study. Mr. Alan Felser, P.E., will serve as the Feasibility Study Leader. He will be supported by Shannon Buckley and Bob Lunardini. Mr. Felser will be responsible for overall coordination of the FS effort and will ensure continuity between the RI/FS and Remedial Design.

NAS CECIL FIELD PROJECT ORGANIZATION CHART

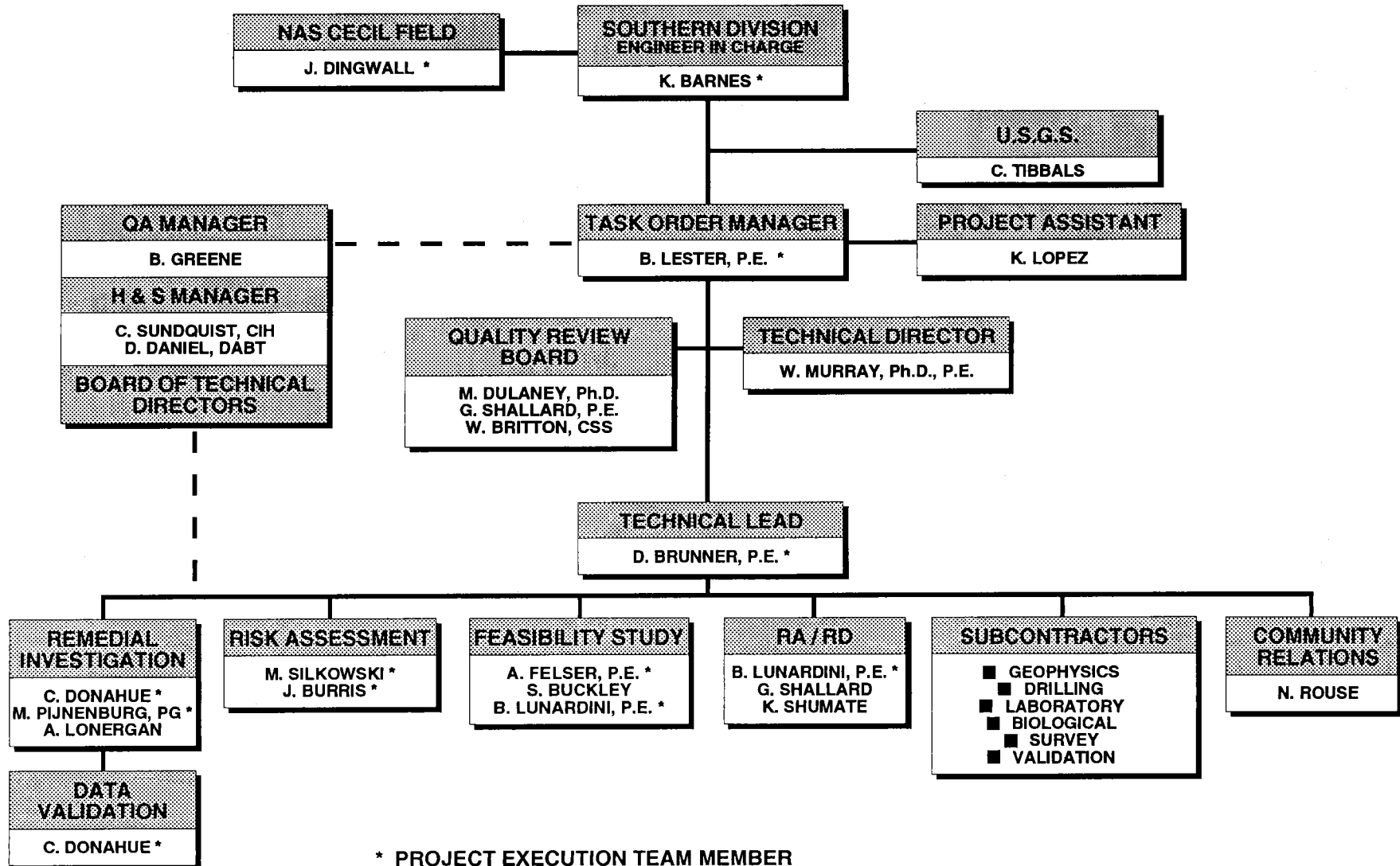


FIGURE 6-1

Remedial Design/Removal Action. Bob Lunardini, P.E., will serve as Remedial Design Leader. He will be responsible for coordinating design efforts with other appropriate team members and senior design personnel within the company. Mr. Lunardini will be supported by Geoff Shallard, P.E., Senior Consulting Engineer, and Katherine Shumate. Mr. Lunardini will also be involved with the FS to ensure continuity as remedial designs, plans, and specifications are developed.

Subcontractors. It is anticipated that several subcontractors will be used to complete tasks. These include:

- geophysics,
- drilling,
- analytical laboratory services,
- biological laboratory services,
- location survey, and
- data validation.

The appropriate team members will use information received from these subcontractors in preparation of the documents and deliverables to the Navy.

The Project Team will include additional key personnel as follows.

Health and Safety. Cindy Sundquist, CIH, will serve as the corporate Health and Safety Officer. She will be responsible for health and safety audits in compliance with Corporate Health and Safety policies as well as required OSHA compliance standards. She will be supported by David Daniel.

Community Relations. Nancy Rouse will serve as the Community Relations Specialist. She will be responsible for maintaining and updating Community Relations Plans, coordination and oversight of the Administrative Record update, and will participate in community relation efforts throughout the course of the program with the appropriate public meetings and availability sessions being conducted.

PERFORMANCE CRITERIA AND MONTHLY EVALUATION

The October 1, 1992, Amendment to the Navy CLEAN contract incorporates an Award Fee Plan based on performance evaluation categories, criteria, and rating guidelines. In order for both the Navy and ABB-ES to evaluate performance, frequent feedback and continuous communication is required. Attachment "C" to the CLEAN contract provides the rating guidelines for evaluation criteria. The Award Fee is to motivate ABB-ES to provide excellent performance of activities related both collectively and individually in the areas of Program Management and Environmental Services. Program Management constitutes management, administrative, and clerical activities performed by ABB-ES in order to assure quality control of all work performed under the CLEAN contract. These criteria include:

- organization and management,
- fiscal control, and
- quality and timeliness of deliverables.

The Technical Services category or Environmental Services include:

- quality and timeliness of deliverables,
- task management, and
- fiscal control.

Attachment "C" of the CLEAN contract contains the rating guidelines and outlines a general listing of characteristics associated with an expected level of performance for each rating category. These include:

- excellent,
- highly satisfactory,
- satisfactory,
- marginal, and
- unsatisfactory.

ABB-ES will strive to completely fulfill all requirements of the CLEAN program and perform at the highest levels of excellence. However, communication is the key to success. Therefore, it is proposed as part of this POA that an evaluation form be provided to the Navy on a monthly basis in association with the TFMR. ABB-ES feels that this will allow frequent feedback on its performance to be provided by the Navy and will act as a valuable Performance Management tool.

It is recognized that the basis for the determination of the Award Fee shall be the evaluation performed by the Navy; however, ABB-ES feels that improvement and continuous striving for excellence can only be accomplished mutually. Therefore, at the beginning of the CTO activities, it is suggested that ABB-ES and the Navy establish the criteria or format for this monthly report and that a partnership be established to promote successful performance under this contract. As a starting point for establishing criteria and format, a draft evaluation form is provided in Appendix D.

SCHEDULES

Schedules for completion of Tasks are provided in Appendix C. In preparing schedules for the Draft POA, it was assumed that the notice to proceed (NTP) would be received March 1, 1993. Compliance with SOW deliverable dates will need to be re-evaluated since NTP is June 18, 1993 based on the definitized contract task order. Therefore, the October 20, 1993 SMP schedule will not be achievable.

However, ABB-ES is committed to adjust workloads and activity and labor resources to accommodate future regulatory dates, particularly those that will be cited in the SMP for 1994.

To accomplish the requested work activities and deliverables requested in the SOW for OUs 1, 2, and 7, at least two field crews, including subcontractor support, will be necessary.

Preparation of draft primary documents assumes that the NRPM will review an internal draft of the RI, RA, and FS reports over a 2- to 4-day period in our Tallahassee offices. The period of 45 days provided in the SOW for preparation of draft final primary documents is assumed to follow a 25-day period from receipt of comments (including USEPA and FDER comments) from the Navy to prepare a response to comments. Although the FFA provides for 60 days for each of these two periods, ABB-ES recognizes the desire of the Navy to adhere to the accelerated schedule period of 45 days for each of the two periods and is committed to meeting the schedule requested in the SOW.

The primary document schedule identified in this POA is based on the assumption that the USEPA and FDER will not activate dispute resolution following receipt of a Final Draft report. Therefore, at the end of a 30-calendar-day comment period, ABB-ES will be notified by the Navy to proceed to issue the final report within the 15 calendar days specified in the SOW. If either one of the agencies disputes the Final Draft report, then a longer period (e.g., 60 days) after notification by the NRPM may be required to revise the report in accordance with the dispute resolution.

Schedules presented for the two removal actions (POA Tasks 17 and 18) assume that USEPA and FDER do not consider the deliverables (FFS, Action Memorandum, and Design Plans and Specifications) to be primary documents. This assumption is consistent with the role of the Navy as the lead agency, as all parties will be given an opportunity for review during the 30-day public comment period. If the Navy wishes to consider these documents similar to RI/FS, ROD, and Remediation Design Plans and Specifications, then the reporting schedule and deliverables must be modified to provide the required Final Draft and Final Documents as specified in the FFA.

BASIS FOR COST

The costs associated with the Scope of Services are based on ABB-ES' current understanding of site conditions. The following assumptions form the basis for costs.

- Total duration of the project will not exceed 26 months. Significant completion of task work is expected by November 1, 1994; however, regulatory review and comment on the last FS report must be addressed and closeout of CTO will take place.
- Treatability Testing is limited to literature reviews and bench scale (Jar) tests.
- The reports to be delivered are based on the schedule in Appendix C. Changes to these scheduled dates, because of the current dispute resolution, are not taken into account in the development of the cost proposal.
- USEPA and FDER will not invoke dispute resolution for primary deliverable Final Draft reports.
- Sufficient information will be collected during the planned screening and remedial field activities to complete the RIs, RAs, and FSs.
- Offsite disposal of contaminated soils and groundwater at a RCRA-permitted facility is not costed. An allowance has been included for disposal of soils in municipal landfills.
- TRC and NRT comments will not substantially impact work under this POA.
- Sites will be investigated in Level D protective equipment, except where specifically identified otherwise.
- Confirmational sampling at OU 1 will not identify significant contaminants that would prevent delisting of the site.

APPENDIX A
STATEMENT OF WORK



07 June 1993

Commanding Officer
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, SC 29418

Attention: Janet Morris, Code 0233JM

Subject: Transmittal of Final Cost Estimate
CTO #090 - Phase II RI/FS at OUs #1, #2, and #7, NAS Cecil Field

Dear Janet:

Enclosed please find the Final cost estimate for CTO #090, Phase II RI/FS at OUs #1, 2 and 7, NAS Cecil Field. This final position incorporates all of the changes discussed during negotiations, including revisions to subcontract estimates, and other changes to the level of effort necessary to fully investigate Site 3, as identified in our memorandum dated 1 June 1993.

If the estimate contained herein is acceptable, we will complete revision of the Plan of Action and submit a Final Plan of Action as expeditiously as possible.

Please be advised that the original project schedule assumed a start date of 01 March 1993, which would have enabled ABB Environmental Services, Inc. (ABB-ES) and SOUTHNAVFAC to satisfying schedule requirements contained in the 20 October 1992 Site Management Plan, referenced in the Statement of Work. CTO #090 was issued, as an undefinitized order, on 08 April 1993; however, insufficient funding was made available to initiate major subcontract activities to support execution of the RI/FS at NAS Cecil Field. Therefore, the schedule set forth in the 20 October Site Management Plan will not be met. It is requested that revisions to the Statement of Work include this necessary change to the project schedule, and that the schedule incorporated into the Final Plan of Action supersede that contained in the Site Management Plan for NAS Cecil Field.

ABB-ES is currently revising the Primavera schedule to reflect the negotiated level of effort; this schedule anticipates that additional funding, sufficient to initiate major subcontract activities, will be made available no later than 14 June 1993.

ABB Environmental Services Inc.



Subject: Transmittal of Final Cost Estimate
CTO #090 - Phase II RI/FS at OUs #1, #2, and #7, NAS Cecil Field

Inquiries concerning this matter may be directed to me at 904-656-1293.

Very truly yours,

ABB ENVIRONMENTAL SERVICES, INC.

Laurie Huffman
Contracts Manager

cc: Cliff Casey - RPM